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A REVISION

OF THE

CROTALARIAS OF SOUTH AND SOUTH-EAST-TROPICAL AFRICA.

By I. C. Verdoorn.

The Division of Veterinary Services at Pretoria having pointed out the need of a critical account of the genus *Crotalaria* for South Africa, I was requested by the Chief of the Division of Botany, Horticulture, and Entomology, to undertake the task. The urgency for this had been emphasised on account of some species being injurious to stock whilst others were regarded as potential fodder crops. As the whole of the African species had been recently revised by Mr. E. G. Baker* it seemed at first only necessary to take up the South African species, but it was soon realised that as so many of the tropical African species seemed to be making their way south, it would be advisable to extend the boundary. The region covered is shown in the accompanying map and it includes the whole of the Union of South Africa, Rhodesia, Nyassaland, and Portuguese East Africa.

In tropical and South Africa, over 300 species were enumerated by Mr. Baker. In the present account which covers approximately one quarter of that area there are 124 species.

A considerable number of the tropical African species have a very great range over widely differing climatic conditions, and their satisfactory delimitation into species is often a matter of difficulty. Many of these range into South Africa and there they ap pear to be still somewhat in a state of flux, apparently breaking up in their new habitat into segregate forms many of which seem to be worthy of specific rank.

Some of these had been previously treated as subspecies or varieties, but I have found it preferable to regard them as separate units, for most of them are distinguished by as good characters as any others.

I am particularly indebted to the Director of the Royal Botanic Gardens, Kew, and to the Keeper of the Herbarium, for full facilities for carrying out this work during my stay in England. They very kindly procured on loan from other herbaria, all the necessary type specimens that were not represented at Kew, especially from Berlin, Zurich, and Upsala. In addition, numerous visits were paid to the herbarium at the Natural History Museum, South Kensington, and I am very grateful to Dr. A. B. Rendle and Mr. E. G. Baker for their unfailing courtesy and help. Besides these Archdeacon F. A. Rogers has generously supplied a large amount of material for inclusion. A short visit was paid to the herbarium at Brussels where, with the kind permission of Dr. de Wildeman, I was able to examine the rich material from the Congo. I am also deeply indebted to Mr. J. Hutchinson for assistance on critical points and general supervision.

* E. G. Baker: The African Species of Crotalaria, *Journ. Linn. Soc. Bot.* 42: 241–425 (1914).

VALUE OF CHARACTERS.

If we assume that the more primitive of the *Papilionaceae* have pinnate leaves, it seems reasonable that other things being equal, the digitate, trifoliolate, and unifoliolate types have been evolved in the order named, the unifoliolate form being the most advanced. This view is strengthened in reference to the species of *Crotalaria* by a higher type of inflorescence, namely sub-capitate or densely spiciform, and the petiole is mostly pulvinate at the top. I have therefore used the number of leaflets as the primary character in the key. Another important development seems to have been due to climatic influence, namely the production of spines, usually by the hardening of the short lateral branchlets. It is interesting to note that these all occur in the trifoliolate group, and are not accompanied by the reduction in the number of leaflets. A third valuable character is found in the foliaceous stipules of a number of species which, although an apparently advanced character, I have placed early in the key for practical purposes. These represent most of the general morphological characters of any stability which are available for use. Further sub-divisions in the key are based mainly on rather artificial grounds, such as the shape of the keel, the character of the inflorescence, the shape and size of the pods, and other minor features.

IMPERFECTLY KNOWN SPECIES.

C. aspalathoides Lam.	A poor specimen, possibly not a *Crotalaria*.
C. angustissima E. Mey.	A poor specimen, possibly not a *Crotalaria*.
C. Schultzei Harms	Name only.
C. Rangei Harms	Fruiting specimen only, does not appear to be a *Crotalaria*, but affinities uncertain.

EXCLUDED SPECIES.

C. Ecklonis Harms.	Better referred to *Lotononis*.
C. sparsiflora E. Mey.	Better referred to *Lotononis*.

The following abbreviation has been used throughout :—
Bak. f.=E. G. Baker, in Journ. Linn. Soc. Bot., Vol. 42 (1914).

For the limitations of the genus I have followed Mr. Baker. See Journ. Linn. Soc. Bot. 42 : 241–425 (1914), page 251.

DESCRIPTION OF GENUS.

Herbs or shrubs, erect or sometimes trailing, leaves 1–5–foliolate, usually 3–foliolate. Calyx with lobes usually bilabiate, the upper lip bifid, the lower trifid, rarely the 4 upper lobes approaching in pairs. Standard orbicular, obovate, or ovate, mostly cordate and bicallosed at the base within and usually clawed. Wings shorter than the keel. Keels bent near the base or about midway (i.e., somewhat L-shaped or U-shaped in outline) and ending in a beak. Stamens monodelphous ; the alternate anthers smaller and on longer filaments. Ovary sessile or stipitate, 2 to many ovuled ; style knee–bent, often laterally pubescent. Pods sessile or stipitate, inflated.

KEY TO THE SPECIES.

Leaves 3–5-foliolate rarely the upper leaves reduced to a single leaflet (*C. erythrophleba*).
Plants not spinous.
Stipules leaf-like, obovate, large ovate-cordate, or at least some on each branch ovate, lanceolate-, or linear-falcate.
Stipules obovate and shortly petioled, 5–20 mm. long ; flowers about 2·5 cm. long ; calyx softly pubescent. 1. *C. capensis.*
Stipules ovate, cordate at the base, 7–18 mm. long, broader than the leaflets ; flowers 1–1·3 cm. long ; calyx thinly strigose. 2. *C. xanthoclada var. Stolzii.*
Stipules linear-lanceolate-, or ovate-falcate, rarely some on the same branch, small, subulate.
Flowers large 1·5–2·5 cm. long, with the calyx densely tomentose ; pods densely tomentose. 3. *C. lachnocarpa.*

Flowers up to 1·5 cm. long, calyx never densely tomentose ; pods villose, pubescent or glabrous.
Pods long-villose ; calyx about as long as the corolla ; keels abruptly narrowed into a small sharp slightly hooked beak, upper margin shallowly lobed near the apex, glabrous. 4. *C. Goetzei.*
Pods shortly or appressedly pubescent to glabrous ; calyx shorter than the corolla ; keels gradually narrowed into the beak, upper margins not lobed, bearded.
Ovary pubescent at least along the upper suture ; pod glabrescent ; a prostrate plant with long, slender terete branches radially spreading. 5. *C. Rhodesiae.*
Ovary and pod quite glabrous.
Racemes terminal ; calyx glabrescent with wide sinuses between the short teeth. 6. *C. natalitia.*
Racemes leaf-opposed ; calyx pubescent, sometimes thinly pilose with acute sinuses between the long lobes.
Stipules each of 1 leaf-like ovate-falcate lobe, broadest at the base, one side rounded, very shortly petioled, hirsute, with appressed or patent hairs ; pods 2–3 cm. long ; pedicels 3–6 mm. long. 7. *C. podocarpa.*
Stipules each 2–4-lobed ; one lobe large, lanceolate to ovate-falcate, cuneate at the base into the petiolule and spurred by 1 or 3 similar but smaller lobes ; pubescence always appressed ; pods 1·8–2·8 cm. long ; pedicels 2–3 mm. long. 8. *C. damarensis.*
Stipules each of 1–2 oblanceolate-falcate lobes, broadest near the apex and long cuneate into a distinct petiolule ; plant thinly patently pilose ; pods up to 2 cm. long ; pedicels 2–3 mm. long. 9. *C. Marlothii.*
Stipules each of 1 linear slightly flacate lobe, cuneate at the base ; plant densely hirsute ; pods about 2·5 cm. long ; pedicels 3–5 mm. long. 10. *C. hirsutissima.*
Ovary densely pubescent ; pods shortly pubescent.
Pods cylindric, sessile or shortly stipitate ; erect branching shrubs ; branches striate.
Pods 12–17 mm. long ; flowers up to 10 mm. long. 11. *C. goreensis.*
Pods 25–30 mm. long ; flowers 1–1·5 cm. long. 12. *C. cylindrocarpa.*
Pods oblong, distinctly stipitate ; stems many from the rhizome, unbranched, short-terete. 13. *C. pseudopodocarpa.*
Stipules absent or if present subulate, ovate, lanceolate, linear or long setaceous, not leaf-like or falcate.
Calyx 4-lobed almost to the base ; lobes broad and foliaceous, entirely enveloping the corolla, drying black. 14. *C. nigricans.*
Calyx 5-lobed (rarely 3-lobed by fusion in *C. agatiflora*).
Flowers in distinct dense terminal globose heads overtopped by the basal leaves.
Leaflets oblanceolate, becoming much longer towards the apices of the branches, pilose on both surfaces. 15. *C. cephalotes.*
Leaflets oblong-elliptic or oblong-lanceolate, glabrous on the upper surface ; clayx lobes linear setaceous, exceeding the corolla. 16. *C. ononoides.*
Flowers usually in racemes, if in terminal heads then not overtopped by the basal leaves.
Keels rounded somewhere about the middle, boat-shaped or broadly U-shaped, ending in a long or short beak.
Pods small and sub-spherical like a pea seed, about 4 mm. in diameter ; flowers small, about 5 mm. long, numerous in long leaf-opposed racemes. 17. *C. nubica.*
Pods various, never small and spherical like a pea seed.
Plants obviously procumbent ; branches many from the base and trailing.
Leaves sessile ; flowers small, red, solitary. 18. *C. leptoclada.*
Leaves distinctly petioled ; flowers various.
Standard densely hirsute on the back ; leaflets silky appressedly pubescent beneath. 19. *C. sericifolia var. gweloensis.*
Standard glabrous or pubescent on the mid-rib only ; leaflets not silky pubescent.
Pods not twice as long as broad.
Plant patently hispid with bulbous-based hairs ; pedicels short, 1–2 mm. long. 20. *C. hispida.*
Plant thinly appressedly pilose ; pedicels long and slender up to 6 mm. long. 21. *C. Preladoi.*
Pods twice or more than twice as long as broad, plants variously hairy.
Racemes laxly many-flowered almost from the base of the peduncle ; bracts small, cordate, reflexed, persistent. 22. *C. Schinzii.*
Flowers in the upper half of the peduncles only ; bracts usually linear or subulate.
Whole plant villose canescent with whitish hairs ; pods about twice as long as broad. 23. *C. mollis.*
Plants patently hairy or appressedly pubescent ; pods more than twice as long as broad.

Plants usually patently hairy; stipules 3–10 mm. long; bracteoles at the base of the calyx conspicuous, 2–5 mm. long.
Flowers 10–15 mm. long, broader than long; keel very much rounded and the beak almost completing a circle; stipules up to 10 mm. long; pods over 1 cm. broad. 24. *C. obscura.*
Flowers 7–10 mm. long, not broader than long; keel broadly U-shaped or boat-shaped; stipules up to 5 mm. long; pods less than 1 cm. broad. 25. *C. lotoides.*
Plants strigose or closely appressedly pubescent; stipules 1–2·5 mm. long; bracteoles near apex of pedicels or in lower half, small, about 1 mm. long.
Branches long; bracteoles in lower half of the pedicels. 26. *C. gazensis.*
Branches short; bracteoles at base of calyx.
Peduncles, 1–2-flowered; branches very slender, less than 1 mm. in diameter near the base; flowers 8–12 mm. long. 27. *C. excisa.*
Peduncles—to several flowered; branches a little more than 1 mm. in diameter near the base; flowers 10–15 mm. long. 28. *C. effusa.*

Plants erect or apparently erect.
Flowers 2–3 in the axils of the leaves on slender pedicels. 29. *C. axillaris.*
Flowers in racemes or at the ends of branches, not axillary.
Flowers larger than the leaflets or at least the upper ones, if not obviously so then petioles much longer than the leaflets.
Flowers 4–5 cm. long. 30. *C. agatiflora.*
Flowers up to 3 cm. long.
Whole plant or at least the ovary glabrous.
Racemes several- or many-flowered; bracts and calyx-lobes not hardening into a sharp apex.
Pods including stipe 8–10 cm. long, the pod 6–8 times as long as broad; petioles herbaceous, numerous, sub-erect; leaflets usually retuse at the apex. 31. *C. australis.*
Pods including stipe 5–7 cm. long, the pod 2–3 times as long as broad; petioles somewhat herbaceous, mostly spreading; leaflets broadly acuminate, rarely retuse at the apex. 32. *C. laburnifolia.*
Racemes up to 6-flowered; bracts and calyx-lobes hardening into a sharp apex; peduncles often zig-zag. 33. *C. longidens.*
Plant appressedly pubescent; ovary shortly tomentose.
Petioles clustered on abbreviated lateral shoots, more than twice as long as the leaflets and the internodes. 34. *C. athroophylla.*
Petioles not on abbreviated shoots, slightly longer than the leaflets and internodes.
Flowers up to 22 mm. long, in lateral few-flowered racemes.
Leaflets rather sparse 1·5–4 mm. broad; branches slender and glabrescent. 35. *C. rigidula.*
Leaflets not sparse, 3–12 mm. broad; branches softly pubescent.
Leaflets 6–12 mm. long, 3–9 mm. broad. 36. *C. Monteroi.*
Leaflets 10–30 mm. long, 3–12 mm. broad. *C. Monteiroi var. Galpinii*
Flowers up to 12 mm. long, in long terminal laxly many-flowered racemes. 37. *C. Pearsonii.*
Plant patently pilose; ovary pilose. 24. *C. obscura.*
Flowers not obviously larger than the leaflets; petioles rarely longer than the leaflets but then flowers smaller.
Leaves sessile or minutely petioled; leaflets very small, oblanceolate, 5–15 mm. long, 1·5–4 mm. broad. 38. *C. harmsiana.*
Leaves petioled, sometimes shortly so but then leaflets not very small.
Pods broadly oblong with a long stipe; stipe ⅓ to more than ½ the length of the pod, 6–10 cm. long.
Standard on the back and keels near lower margin sericeus pubescent. 39. *C. Doidgeae.*
Standard and keels glabrous.
Flowers large, 2–2·5 cm. long. 40. *C. Ceciliae.*
Flowers up to 1·7 cm. long.
Flowers purple; calyx intruse at the base; leaves obovate or oblong-cuneate. 41. *C. purpurea.*
Flowers yellow; calyx not intruse at base; leaves lanceolate-oblong. 42. *C. Barnabassii.*
Pods sessile or shortly stipitate, if stipe ⅓ the length of pod then only 3–4 cm. long.

Shortly appressedly pubescent plants with a glabrescent somewhat glaucous calyx; pedicels usually pubescent at least up to the bracteoles.
Racemes with a few large flowers; flowers about 2·5 cm. long. 40. *C. Ceciliae.*
Racemes elongated, many-flowered.
Leaflets broadly obovate, elliptic, or oblong cuneate, about twice as long as broad. 43. *C. recta.*
Leaflets lanceolate or narrowly oblong, several times as long as broad.
Flowers 6–11 mm. long; pods very narrowly cylindric, less than 5 mm. broad. 44. *C. lanceolata.*
Flowers 1·5–2·5 cm. long; keels narrow, boat-shaped, gradually narrowing into a long beak. 45. *C. intermedia.*
Flowers 1·5–1·8 cm. long; keels broad, U-shaped, abruptly narrowed into a short beak. 46. *C. simplex.*
Plants variously pubescent with the calyx and pedicels equally hairy or lobes pilose-ciliate; calyx not glabrescent glaucous.
Petioles short, 2–10 mm. long and $\frac{1}{3}$ or much less the length of the terminal leaflet.
Keels gradually narrowing into the beak.
Petioles about 2 mm. long; flowers numerous in a dense terminal raceme; pods densely brown pilose. 47. *C. vasculosa.*
Petioles up to 10 mm. long; flowers few in short leaf-opposed racemes. 48. *C. Schlechteri.*
Keels abruptly narrowed into a beak.
Whole plant densely and shaggily pubescent; flowers up to 1·5 cm. long; racemes often elongated and many-flowered; pods densely ferruginous pilose. 49. *C. lachnocarpoides.*
Pubescence more or less appressed and not long and shaggy; flowers less than 1·5 cm. long; racemes short, lateral or terminal, few-flowered.
Leaflets oblong-elliptic, shortly cuneate at the base; standard densely hairy to silky, tomentose on the back.
Petioles up to 3 mm. long; flowers about 12 mm. long; branches stout and woody. 50. *C. amoena.*
Petioles 10 mm. or more long; flowers 8–9 mm. long; branches rather slender woody. 19. *C. sericifolia var. gweloensis.*
Leaflets oblanceolate or narrowly oblong, long cuneate at the base; standard glabrous or thinly hispid on the mid-rib and apex.
Plant strigose; pod sub-globose, 5–9 mm. long, 5–8 mm. broad, drying black, appressedly pubescent. 51. *C. dura.*
Plant puberulous to appressedly villose pubescent; pods oblong, 1·5–2·2 cm. long, villose or pilose.
Leaflets small, 5–20 mm. long; flowers 6–9 mm. long. 26. *C. gazensis.*
Leaflets 1–5 cm. long; flowers 10–12 mm. long. 52. *C. rotundicarinata.*
Petioles exceeding 10 mm. or if about that then about as long or not much shorter than the leaflets.
Racemes lateral or terminal, 1–12-flowered, not much elongating.
Stipules none; stems white, smoothly puberulous. 53. *C. argyraea.*
Stipules present.
Pubescence silvery or silky; pods tomentose.
Standard densely hirsute all over the back; pods 1–1·5 cm. long. *C. sericifolia var. gweloensis.*
Standard with a line of hairs along the mid-rib, otherwise glabrous; pods 2–3 cm. long.
Whole plant silvery sericeus hirsute; racemes rather densely few- to many-flowered. 54. *C. erecta.*
Whole plant appressedly silky pubescent; racemes rather laxly few-flowered. 55. *C. colorata.*
Pubescence never silvery; pods patently villose or pilose.
Flowers 1 to several in the upper half of long peduncles.
Flowers 1·5–2 cm. long with the beak not hooked; leaflets lanceolate to narrowly oblong; stipules 1–1·5 cm. long. 56. *C. burkeana.*
Flowers 10–15 mm. long and broader than long with beak distinctly hooked; leaflets variable lanceolate or obovate; stipules up to 10 mm. long; pods over 1 cm. broad. 24. *C. obscura.*

Flowers 7–10 mm. long, not broader than long, stipules up to 5 mm. long; pods less than 1 cm. broad. 25. *C. lotoides.*
Flowers about 2 in short racemes on the leafy lateral branchlets. 52. *C. rotundicarinata.*

Racemes elongated, many-flowered.
Leaflets small, 6–12 mm. long, 3–6 mm. broad. 37. *C. Pearsonii.*
Leaflets much exceeding 12 mm. long.
Leaflets broadly obovate, long stipulate.
Pubescence silvery and silky.
Plant sericeus hirsute; racemes densely many-flowered. 43. *C. erecta.*
Plant appressedly sericeus pubescent; racemes laxly few-flowered. 55. *C. colorata.*
Pubescence not silvery and silky. 57. *C. incana.*
Leaflets of various shapes, if somewhat obovate then stipules absent; stipules none or deciduous.
Flowers 6–11 mm. long; leaflets usually long and narrowly lanceolate; calyx with 5 short teeth. 44. *C. lanceolata.*
Flowers 9–20 mm. long; leaflets various rarely lanceolate; calyx lobes as long as or longer than the tube.
Stems white silky puberulous; pods obovate, up to 15 mm. long, stipitate. 53. *C. argyraea.*
Stems not white or silky; if grey sericeus then pods cylindric up to 2·5 cm. long.
Bracts at the base of the pedicels evident, persistent.
Leaves 3–5-foliolate; stems softly and densely pubescent; bracteoles not exceeding the calyx. 58. *C. cleomifolia.*
Leaves 3-foliolate; stems thinly strigose; bracteoles long, exceeding the calyx. 59. *C. chirindae.*
Bracts at the base of the pedicels deciduous.
Keels pure wine-coloured. 60. *C. Rogersii.*
Keels yellow or striped with purple.
Keels yellow, 2 cm. long and up to 1 cm. broad. 61. *C. tabularis.*
Keels striped with purple, narrow, up to 5 mm. broad.
Leaflets broadly elliptic to oblong-cuneate, 3–5 cm. long, 1·5–5 cm. broad. 62. *C. striata.*
Leaflets all elliptic or ovate-cuneate, 2·5–5 cm. long, 1–2 cm. broad. 63. *C. Nicholsonii.*

Keels bent in the lower half, ending in a long straight beak, somewhat L-shaped; pods oblong, obovate, or small and spherical like a pea seed.
Pods erect, up to 2 cm. long; branches 4-angled; leaflets 1·5–4·5 cm. long, 4–18 mm. broad. 64. *C. flavicarinata.*
Pods erect on straight erect pedicels, mostly spherical, small, 3–8 mm. long; leaves small, erect or sub-erect.
Flowers more or less hidden in the sub-erect leaves; terminal racemes scarcely showing above the leaves. 65. *C. Buchananii.*
Flowers obvious in clusters or in long terminal racemes.
Terminal racemes with few and distant flowers, which are from 8–15 mm. apart.
Leaves few, soon falling off; leaflets small, 4–10 mm. long. 66. *C. sparsifolia.*
Leaves not soon falling off, erect; leaflets 10–18 mm. long. 67. *C. filicaulis.*
Terminal racemes many-flowered, or the flowers close together.
Pods oblong-globose, 6–8 mm. long, 4–5 mm. broad; racemes terminal, with the upper flowers sub-umbellate; flowers 7–10 mm. long. 68. *C. argyrolobioides.*
Pods oblong, very small, 5–7 mm. long, 2–3 mm. broad; flowers 5–7 mm. long, in racemes or aggregated in small heads. 69. *C. microcarpa.*
Pods spherical, up to 4 mm. in diameter; flowers in racemes, sometimes very crowded, and in the axils of the leaves.
Flowers crowded in large oblong terminal racemes which are 1·5–2 cm. in diameter. 70. *C. nyikensis.*
Flowers in elongated racemes, not densely crowded, often one or more in the axils of the stem leaves.
Terminal racemes branched; flowers usually 2, rarely 3, in the axils of the stem leaves. 71. *C. phyllostachys.*
Terminal racemes simple; flowers several, in the axils of the stem leaves. 72. *C. Mumbwae.*
Flowers in terminal racemes only, or sometimes solitary in the axils of the upper leaves.

Flowers 8–9 mm. long; standard sparingly hairy near the apex; upper leaves reduced to 1 leaflet. 73. *C. erythrophleba.*
Flowers 3–6 mm. long; standard appressedly pilose on the back; all leaves trifoliolate.
Flowers 3–5 mm. long; bracts shorter than the pedicels. 74. *C. hyssopifolia.*
Flowers 6 mm. long; bracts as long or longer than the pedicels; pubescence loosely appressedly pilose. 75. *C. Johnstonii.*
Pods pendulous; pedicels at length nodding or patent; leaves various.
Plants obviously prostrate, with long trailing branches.
Calyx about 1 cm. long, glabrous, with the lobes thinly hispid on the margins, conspicuously bi-bracteolate at the base; bracteoles ovate-lanceolate, 4–6 mm. long; whole plant thinly patently hispid. 76. *C. geminiflora.*
Calyx if 1 cm. long not glabrous or conspicuously bi-bracteolate at the base.
Flowers small, clustered at the apices of leaf-opposed peduncles, which are about as long as the leaves.
Pods like pea seeds, tomentose; leaflets pilose beneath.
Inflorescence shorter than the subtending leaf; petioles 6–20 mm. long.
Leaflets sub-orbicular or broadly obovate, 11–25 mm. long, 6–15 mm. broad. 77. *C. pisicarpa.*
Leaflets oblong-cuneate or elliptic, broad and narrow on the same plant, 20–50 mm. long, 5–14 mm. broad. 78. *C. pilulicarpa var. Schinzii.*
Inflorescence slightly longer than the subtending leaf; petioles 20–28 mm. long. 79. *C. reptans.*
Pods oviform; leaflets silky pubescent beneath. 19. *C. sericifolia var. gweloensis.*
Flowers in racemes.
The whole plant patently hispid, with bulbous-based hairs; flowers small, up to 7 mm. long. 20. *C. hispida.*
Plants softly pubescent; flowers mostly more than 8 mm. long.
Plant conspicuously white villose pubescent; standard pubescent on the mid-rib only. 23. *C. mollis.*
Plants shortly pubescent; standard pubescent all over the back.
Calyx-lobes broad, abruptly acuminate into an oblique acute apex; leaflets obovate, strongly cuneate. 80. *C. Dinteri.*
Calyx-lobes deltoid or deltoid acuminate; leaflets narrowly oblong to oblanceolate.
Racemes laxly few-flowered (about 12); bracts 1–2 mm. long; calyx-lobes deltoid. 81. *C. Friesii.*
Racemes many-flowered; bracts 3–4 mm. long; calyx-lobes acuminate. 82. *C. shamvaensis.*
Erect or slightly decumbent plants, not with long obviously trailing branches.
Pods large, long-stipitate, about 4 cm. long including the stipe, 1·7 cm. broad; flowers about 1·5 cm. long; stipules small, subulate; leaflet obovate, 1–3 cm. long, 6–15 mm. broad. 83. *C. macrocarpa.*
Pods large, oblong, 3–5 cm. long, 1·5–2·5 cm. broad, cuneate at the base, pilose with patent hairs; stipules 10–15 mm. long, linear-setaceous.
Branches patently pilose; leaves 3–5-foliolate; leaflets linear-lanceolate or narrowly oblong, up to 3·5 cm. long, 7 mm. broad. 56. *C. burkeana.*
Branches with appressed, sometimes woolly, pubescence; leaves 3-foliolate; leaflets ovate-lanceolate, 3–8 cm. long, 1–2·5 cm. broad. 84. *C. Stewartii.*
Pods small, globose or oblong, but then less than 3 cm. long.
Calyx-lobes widest at the apex, distinctly apiculate; pods up to 1 cm. long. 85. *C. platysepala.*
Calyx-lobes broad, abruptly acuminate into a rather oblique acute apex; pods 1–2 cm. long.
Flowers about 7 mm. long; pods 1·7–2 cm. long. 86. *C. junodiana.*
Flowers 1–1·5 cm. long; pods 1–1·5 cm. long. 87. *C. maxillaris.*
Calyx-lobes triangular to deltoid acuminate.
Pods numerous and very small, sub-spherical, up to 6 mm. long and 5 mm. broad. 17. *C. nubica.*
Pods more than 6 mm. long and 5 mm. broad.
Pods oblong, 2 cm. long or longer including stipe, distinctly stipitate or clavate.
Calyx glabrescent; young pod clavate, cuneate at the base into a short stipe. 88. *C. deserticola.*
Calyx pubescent; pods distinctly long-stipitate.
A low tufted plant, with many short simple branches from the rhizome. 13. *C. pseudopodocarpa.*
Plants erect and branching.
Racemes elongated, laxly several-flowered; pods narrowly oblong; leaflets linear. 89. *C. Mundyi.*

Racemes short, few-flowered ; pods oblong ; leaflets obovate or oblong-elliptic. 90. *C. natalensis.*

Pods globose, sub-globose, ovoid or oblong-obovate, rarely up to 2 cm. long, sub-sessile or shortly stipitate.

Whole plant obviously softly and densely pilose with pale yellow hairs ; leaflets slightly acuminate at the apex, and apiculate ; bracts linear, about 7 mm. long. 91. *C. oocarpa.*

Plants not softly and densely pilose with pale yellow hairs ; leaves mostly rounded at the apex ; bracts subulate.

Flowers along the branches axillary, or terminal on axillary shoots, rarely with a few leaf-opposed racemes ; peduncles and lateral shoots becoming rigid or spike-like.

Flowers 1–3, at the ends of short rigid axillary shoots ; pubescence of golden hairs ; persistent style-base lateral on the pod. 92. *C. pauciflora.*

Flowers on axillary peduncles or in racemes ; pubescence of pale yellow or whitish hairs ; persistent style-base oblique but terminal on the pod.

Calyx-lobes as long or shorter than the tube ; bracteoles 2 at the base of the calyx. 93. *C. distans.*

Calyx-lobes distinctly longer than the tube ; bracteoles 2 on the pedicel.

Keels with beaks up to 7 mm. long ; flowers mostly 1–3 on thread-like peduncles. 94. *C. grantiana.*

Keels with beaks 1 cm. or more long ; peduncles sometimes slender but not thread-like.

Branches whitish tomentose, the lateral ones mostly short ; leaves fascicled and crowded. 95. *C. longistyla.*

Branches softly pubescent, virgate ; leaves not crowded, sometimes 2–3 at a node. 96. *C. virgulata.*

Flowers usually at the top of the plant in lax leaf-opposed or terminal racemes with only a few along the branches ; plants rather rigid.

Standard glabrous or very obscurely pubescent on the back ; pods sub-globose, 7–8 mm. in diameter, lemon coloured. 97. *C. leubnitziana.*

Standard pubescent on the back.

Bracts at the base of the pedicels about 1 mm. long, cuculate, not subulate. 98. *C. Kurtii.*

Bracts at the base of the pedicels subulate, 1–4 mm. long.

Calyx-lobes deltoid, long acuminate, much longer than the tube.

Plant softly white pubescent, prostrate. 82. *S. shamvaensis*

Plant strigose, erect ; pods marked transversely. 99. *C. Heidmannii*

Calyx-lobes deltoid, not long acuminate, shorter or only slightly longer than the tube.

Pods sub-globose, 1·2 cm. in diameter, shortly stipitate, lemon-coloured. 100. *C. aurea.*

Pods oblong or obovoid, 1–2 cm. long, 5–12 mm. broad, sub-sessile, greenish-yellow.

Racemes long, many-flowered ; flowers 1·2–2·5 cm. long ; mature pods obovoid. 101. *C. Macaulayae.*

Racemes 2–12-flowered ; flowers 0·7–1·4 cm. long ; mature pods oblong. 93. *C. distans.*

Flowers crowning the plant in terminal fairly dense racemes, none along the branches ; plants not rigid or spiky.

Petioles short, 1–5 mm. long.

Plant grey sericeus, more than 25 cm. high. 102. *C. cinerae.*

Plant thinly strigose, tufted, up to 25 cm. high. 103. *C. caespitosa.*

Petioles 5–17 mm. long.

Racemes numerous, sessile, few-flowered, often appearing as a leafy panicle. 104. *C. florida.*

Racemes many-flowered, not sessile or appearing panicled.

Standard quite glabrous ; pods depressed globose, broader than long. 105. *C. brachycarpa.*

Standard pubescent on the back ; pods sub-globose longer than broad. 106. *C. globifera.*

Plants with distinct straight spines.

Pods obovoid to oblong, 1·3–3 cm. long ; flowers 1·3–2 cm. long ; standard pubescent all over the back. 107. *C. aculeata.*

Pods globose or ovoid, up to 7 mm. long; flowers 6–12 mm. long: standard glabrous or pubescent only towards the tip.
Dichotomously branched plant, with the branchlets ending in a sharp spine. 108. *C. griquensis.*
Virgately branched, with numerous slender patent spines all along the branches. 109. *C. eremicola.*
Leaves unifoliolate.—
Flowers in dense terminal racemes or in terminal heads.
Flowers in heads. 110. *C. anthyllopsis.*
Flowers in dense terminal racemes.
Standard pilose; flowers erect. 111. *C. kipandensis.*
Standard glabrous; flowers cernuous. 112. *C. cylindrostachys.*
Flowers in lax few-flowered racemes, or solitary.
Calyx large, enclosing the corolla, shaggy-, and densely-pilose. 113. *C. calycina.*
Calyx not enclosing the corolla and not densely pilose.
Flowers 1 cm. long or less; keels bent somewhere about the middle; leaves usually more than 5 mm. broad, if less then flowers less than 1·2 cm. long.
Whole plant glaucous; branches slender, rod-like; stipules absent. 114. *C. glauca.*
Whole plant not glaucous; branches more or less fistular and angled or striate; stipules present.
Small erect slender annual up to 18 cm. high. 115. *C. bongensis var. shirensis.*
Plants more than 18 cm. high.
Leaves petiolate.
Flowers yellow; beak not horned. 116. *C. incompta.*
Standard blue on inner face; beak horned. 117. *C. Hislopii.*
Leaves sub-sessile.
Leaves linear-lanceolate to lanceolate, long-attenuated towards the apex; calyx less than half the length of the corolla. 118. *C. spartea.*
Leaves oblong-lanceolate, mucronate but not long-attenuated towards the apex; calyx more than half the corolla. 119. *C. Adamsonii.*
Flowers 1·4–2 cm. long; keels usually bent below the middle; leaves often sparse, very narrow, mostly less than 4 mm. broad.
Leaves linear or linear-lanceolate, 2–4 mm. broad, petiolate.
Calyx 7–9 mm. long, appressedly pubescent; petiole 2–6 mm. long; bracts 3–4 mm. long 120. *C. virgutalis.*
Calyx 5–6 mm. long, glabrescent; petiole 6–17 mm. long; bracts short, 1–2 mm. long- 121. *C. Allenii.*
Leaves very sparse, linear-acicular, 0·5–1·5 mm. broad, sub-sessile or the petiole the same as the leaf-blade.
Branches strigose; calyx appressedly hairy; pedicels bi-bracteolate at the apex; petioles about 1 mm. long. 122. *C. spartioides.*
Branches and calyx glabrescent; pedicels usually bi-bracteolate about midway; petiole 3–10 mm. long. 123. *C. orientalis.*

1. **C. capensis** *Jacq.* Hort. Vindof. 3 : 36 t 64 (1776–7), Bak. f. 405 (which see for synonymy).

Shrub; branches terete, appressedly silky to roughly hairy. Leaves trifoliolate; stipules foliaceous, sometimes obsolete, obovate, very shortly petiolate, mucronate, usually 0·5–2 cm. long; petioles 1–5 cm. long, strigose; leaflets obovate, very shortly petioluled, rounded at the apex, with a small mucro, the intermediate larger than the lateral, 1–5 cm. long, 0·7–2·5 cm. broad, strigose, sometimes the upper surface glabrous. Racemes terminal and lateral opposite the leaves. Flowers large, 2–2·5 cm. long; pedicels 1–1·5 cm. long, roughly hairy, bracteate at the base and about midway; bracts linear, 2–5 mm. long. Calyx 1–1·5 cm. long, softly pubescent; lobes about as long or longer than the tube, lanceolate acuminate; tube widely companulate, narrowing abruptly at the base. Standard somewhat strigose on the back. Keels rounded about the middle, more or less boat-shaped, ending in a blunt beak, glabrous on the surface. Pods cylindric, appressedly pubescent becoming glabrous, long stipitate, about 5 cm. long without the stipe; stipe 0·7–1·5 cm. long.

Cape Province.—Near Capetown, *Ecklon* 224; Table Mountain, *MacGillivray* 506; Knysna, *Kapp* 14; Uitenhage, *Cooper* 1576, *Bolus* 2285, *Ecklon* 1258; Albany, Grahamstown, *MacOwan* 284, *Tuck* 518, *Atherstone* no number; Keiskama, *Hutton* no number, *Dr ge* 1836; Knysna, *Rogers* 15443 and 26768; Komgha, *Schlechter* 6164, *Flanagan* 503; Willowvale, *Hilner* 501; Clydesdale, *Tyson* 2074.

Natal.—*Krauss* 122, *Kuntze* no number, *Cooper* 2216, *Wood* 535, *Mogg* 6947 and 3556, *Wood* 12569.

Swaziland.—*Burtt-Davy* 2749.

Portuguese East Africa.—Lourenco Marques, *Borle* 425.

Transvaal.—Lydenburg, *Burtt-Davy* 1531 ; Barberton, *Burtt-Davy* 290, *Galpin* 661, *Rogers* 24113 ; Zoutpansberg, *Junod* 4371.

2. **C. xanthoclada** *Bojer var.* **Stolzii**, *Bak. f.* in Journ. Linn. Soc. Bot. 42 : 412.

Branches erect, glabrous. Leaves trifoliolate ; stipules leaf-like, broader than the leaflets of the subtending leaf, ovate, cordate, very unequal-based, 7–18 mm. long, 5–10 mm. broad, mucronate, shortly petioled, more or less glabrous ; petioles 5–10 mm. long, grooved, glabrous or hirsute at the apex ; leaflets oblanceolate to obovate, 1–2·3 cm. long, 3–8 mm. broad, glabrescent, minutely mucronate, very shortly petioluled. Racemes terminal, about 12–20-flowered. Flowers 1–1·3 cm. long ; pedicels strigose, slender, 2–4 mm. long ; bracts and bracteoles deciduous. Calyx up to 8 mm. long ; lobes acuminate, rather longer than the tube, thinly strigose. Standard glabrous. Keel evenly rounded about the middle, more or less boat-shaped, ending in a broad beak ; the upper margin with a short white fringe. Pod cylindric, about 1·5 cm. long and 5 cm. broad, glabrous.

Rhodesia.—*Hislop* 2, *Teague* 102.

Nyasaland.—*Johnson* and *Waller* no number.

This variety differs from the type in having the leaves much broader.

3. **C. lachnocarpa** *Hochst.* ex Bak. in Oliver Fl. Trop. Africa 2 : 33 (1871) ; Bak. f. 404.

Branches stout, striate, densely rufo-tomentose. Leaves trifoliolate ; stipules leaf-like, ovate-falcate, acuminate or acute, 0·7–3·5 cm. long ; petioles tomentose, 0·5–4·5 cm. long ; leaflets oblong-cuneate or obovate, 1·5–8 cm. long, 0·6–3 cm. broad, cuneate at the base into a very short petiolule, rounded at the apex, with a very small mucro, silky rufus pubescent on both sides or the upper glabrous. Racemes terminal and lateral. Flowers 1·5–2·5 cm. long ; pedicels densely tomentose, 0·5–1·3 cm. long, bracteate at base and near the apex ; bracts deciduous ; the basal ovate, abruptly acuminate ; the upper linear or lanceolate. Calyx 1·3–1·7 cm. long, densely ferruginous tomentose, 5-lobed ; lobes longer than the tube ; the lower slightly longer and narrower than the 4 upper, which approach in pairs on each side of the flower. Standard glabrous on the back. Keel deeply rounded about the middle, ending in a short beak, the upper margins and portion of the surface long bearded. Pod sessile, oblong, about 3 cm. long, densely ferruginous tomentose.

Rhodesia.—Salisbury, *Eyles* 665 ; Odanzi River, Umtali, *Teague* 56 ; Broken Hill, *Allen* 487 ; Chirinda, *Swynnerton* 373.

South-West Africa.—Minnesera, *Baum* 646.

Nyasaland.—*Stolz* 220, *Johnson* 387, *Whyte* 94.

4. **C. Goetzei** *Harms* in Engl. Jahrb. 28 : 399 (1900) ; Bak. f. 411.

Branches erect, villose pubescent. Leaves trifoliolate ; stipules leaf-like, variable, either linear, or lanceolate-falcate, or elliptic-ovate, from 3–15 mm. long and 1–3 mm. broad, or 10 mm. long and 6 mm. broad, usually mucronate and very shortly petioled, villous beneath ; petiole 0·5–2·5 cm. long, grooved above, villose, with the apex and short petiolules long villose ; leaflets oblong-cuneate or elliptic, 1–5 cm. long, 4–20 mm. wide, villose beneath, mucronate and very shortly petioluled. Racemes axillary and terminal, 2–5-flowered. Flowers 12–14 mm. long ; pedicels 0·5–1·5 cm. long, villose ; bracts linear, about 5–7 mm. long ; bracteoles smaller, midway or on upper half of pedicel. Calyx almost as long as the corolla ; lobes acuminate, longer than the tube, villose. Standard sparingly villous on the back, especially on the mid-rib. Keel evenly rounded about the middle (boat-shaped), ending abruptly in a short beak with the upper margin shallowly lobed near the apex, ciliate. Pod cylindric, 2–3 cm. long, villose, shortly stipitate.

Nyasaland.—Mlanji, *Purves* 35, *Adamson* 358 ; Kondowe to Karonga, *White* 94.

5. **C. Rhodesiae** *Bak. f.* in Journ. Linn. Soc. Bot. 42 : 401. *C. natalitia Meissn. var. procumbens Bak. f.* The Leg. of Trop. Africa 1 : 58.

Branches many from the root, long, slender, radially spreading, faintly grooved or angled, strigose-pubescent. Leaves trifoliolate ; stipules linear and linear-falcate, varying in size on the same plant, 3–10 mm. long, 1–2 mm. broad ; petioles 5–15 mm. long ; leaflets obovate to oblong-cuneate, 7–30 mm. long, 3–13 mm. broad, rounded at the apex, minutely mucronate, cuneate at the base, glabrous above, strigose beneath. Racemes lateral and terminal, leaf-opposed and about as long as the leaves, 2 to several flowered. Flowers 12–15 mm. long ; pedicels 3–5 mm. long ; bracts linear, deciduous, about 1–2 mm. long ; bracteoles 2, about midway on the pedicel, deciduous, linear, 1–2 mm. long. Calyx 7–10 mm. long, appressedly pubescent, with the lobes narrowly deltoid and as long or longer than the tube. Standard glabrous or with a few pilose hairs on the back. Keels rounded about the middle, ending in a short blunt beak, surface pilose to densely bearded with white woolly hairs in the upper half. Pods oblong, 1·5–2·5 cm. long, 7–12 mm. broad, glabrescent, sub-sessile.

Rhodesia.—*Hislop* 46 ; Kalomo, *Rogers* 8214 and 26018 ; Salisbury, *Eyles* 2161 ; Umtali, *Teague* 61.

6. **C. natalitia** *Meissn.* in Hook. Lond. Journ. Bot. 2 : 67 (1843) ; Fl. Cap. 2 : 46 ; Bak. f. 410.

Branches angled and grooved, appressedly pubescent. Leaves trifoliolate ; stipules leaf-like falcate-lanceolate, 0·5–1·5 cm. long ; petioles varying in length from 0·5–3 cm., long pubescent ; leaflets unequal, with the terminal larger than the lateral, obovate-oblanceolate to linear-oblanceolate, shortly petioluled, rounded at the apex, usually with a small mucro, very variable in size, 0·5–5 cm. long, 0·3–1·5 cm. broad, glabrous above, strigose beneath. Racemes terminal, few-flowered. Flowers 1–1·5 cm. long ; pedicels 0·4–1·3 cm. long, bibracteate at the base and again somewhere below the middle, usually pubescent in the lower half only. Calyx 5–8 mm. long, mostly quite glabrous, rarely strigose, broadly cup-shaped ; lobes 5 (2 usually sub-falcate), deltoid, acute, as long as or shorter than the tube, with a more or less U-shaped sinus between each. Standard glabrous on the back. Keel evenly rounded about the middle (boat-shaped), ending in a short blunt beak, with the upper margin and some of the surface densely white woolly-pubescent. Pod oblong, cylindric, stipitate, glabrous, 3·5 cm. long.

Natal.—*Krauss* 339, *Sutherland* no number, *Gerrard* 1724 ; Inanda, *Wood* 1257 ; Illovo, *Wood* 6431 ; Ngoze, *Wood* 10866.

Transvaal.—Zoutpansberg, *Rogers* 21145.

Rhodesia.—Salisbury, *Eyles* 3320 ; Victoria Falls, *Rogers* 1779 and 4024 ; Umtali, *Eyles* 3627, *Teague* 22.

Portuguese East Africa.—Vila Pery, *Esselen* no number.

Nyasaland.—East Coast of Lake, *Riddelsdell* 145 ; Fort Hill, *Whyte* no number, *Whyte* 64 ; Shire Highlands, *Adamson* 94.

7. **C. podocarpa** *DC.* Prod. 2 : 133 ; Bak. f. 407. Subsp. *C. flexuosa* and *C. Belchii* Bak. f. 407. *C. mutabilis* Schinz in Bull. Herb. Boiss. II. 3 : 820 (1903).

Branches terete, appressedly or patently hirsute. Leaves trifoliolate ; stipules of 1 ovate- or lanceolate-falcate lobe, from less than 1–3 cm. long, broadest at the base, with one side rounded, very shortly petioluled, thinly pilose ; petioles variable, 1–5 cm. long, appressedly or patently hirsute ; leaflets variable in size, oblanceolate, obovate, or narrowly oblong-cuneate to broadly elliptic, 1–7 cm. long, 2–25 mm. broad, rounded mostly mucronate at the apex, thinly pilose on the lower surface, glabrous on the upper. Racemes leaf-opposed, 1 to many flowered, lax. Flowers 1–2 cm. long ; pedicels 3–6 mm. long ; bracts long, linear, deciduous. Calyx 7–12 mm. long, thinly pilose or hirsute ; lobes narrowly deltoid acuminate, much longer than the tube. Standard glabrous on the back. Keels abruptly

bent near the base and ending in a long straight beak, white woolly on the upper margins, glabrous on the surface. Pods oblong, 2–3 cm. long, 7–14 mm. broad, glabrous, stipitate ; stipe 3–5 mm. long.

Transvaal.—Waterberg, Warmbaths, *Leendertz* 2045 ; Pietersburg, *Schlechter* 4360.

Bechuanaland.—Kwebe, Ngamiland, *Lugard* 133 and 179 ; Kuruman, *Lanham in Cape Govt. Herb.* 6478.

South-West Africa.—Okahandja, *Dinter* 6.

Rhodesia.—Livingston, *Rogers* 7065 ; Umsweswe, *Borle* 175 ; Mazabuka, *Rogers* 26367.

Portuguese East Africa.—Tete, *Kirk* 4, *Kirk* no number.

This species may be grouped into geographical forms, the extremes of which are more or less easily distinguishable but are linked up by intermediate forms. The specimens from the western districts have larger leaves and denser racemes than those from the east.

8. **C. damarensis**, Engl. Bot. Jahrb. 10 : 27 (1888) ; Bak. f. 409.

C. Fleckii Schinz in Mem. Herb. Boiss. 1 : 128 (1900). *C. Lindneri* Schinz in Viertelj. Nat. Ges. Zurich 52 : 422 (1907).

Branches terete, fairly densely appressedly greyish hirsute. Leaves trifoliolate, varying in size on the same plant and often 2 or more at a node ; stipules leaf-like, 2–4-lobed ; one lobe large, lanceolate- to ovate-falcate, 5–15 mm. long, cuneate at the base into a petiolule and spurred by 1 or 3 similar but smaller lobes, pubescent ; petioles 1–5 cm. long ; leaflets narrowly oblong-lanceolate or oblong-obovate, 1–6 cm. long, 3–12 mm. broad, rounded at the apex and minutely mucronate, shortly cuneate at the base, appressedly pubescent on the lower surface, glabrous above. Racemes leaf-opposed, with 2–15-flowers on the upper half of the peduncle. Flowers 12–15 mm. long ; pedicels short, 2–3 mm. long, pubescent ; bracts long, linear, deciduous. Calyx 6–10 mm. long, appressedly pubescent, becoming somewhat glabrescent ; lobes deltoid, acuminate, much longer than the tube. Standard glabrous. Keels bent near the base and ending in a long straight beak, white woolly on the upper margin, glabrous on the surface. Pods oblong, 1·8–2·8 cm. long, 7–12 mm. wide, glabrous, stipitate ; stipe about 3 mm. long.

Transvaal.—Waterberg, *Smuts* no number ; Barberton, *Rogers* 524, 20352 and 20276 ; Messina, *Rogers* 20716 ; Silwane, *Breyer* no number.

Rhodesia.—*Borle* 406 ; Khami River, *Eyles* 4.

South-West Africa.—Rehoboth, *Fleck* 447, 937, 167 and 453 ; Usakos, *Marloth* 1310.

9. **C. Marlothii**, *Engl.* in Jahrb. 10 : 27 (1888) ; Bak. f. 409.

A small plant about 2–3 dm. high, branching in the upper half ; branches thinly patently pilose. Leaves trifoliolate ; stipules leaf-like of 1 or 2 oblanceolate-falcate lobes, 5–14 mm. long, broadest near the apex and long cuneate into a distinct petiolule of 1–3 mm. long ; petioles 1·5–2 cm. long, thinly patently pilose ; leaflets oblong-lanceolate, 2–4 cm. long, 5–10 mm. broad, cuneate at the base, broad and acute at the apex, thinly pilose beneath. Racemes terminal and leaf-opposed, few to many flowered and dense towards the apex. Flowers about 1·5 cm. long ; bracts long, linear, deciduous ; pedicels short, 2–3 mm. long. Calyx 6–7 mm. long, very thinly pilose, narrowly deltoid, acuminate, about as long as the tube. Standard glabrous on the back. Keels abruptly bent near the base and ending in a long straight beak, glabrous on the surface, white woolly on the upper margins. Pods small, oblong, about 17 mm. long and 8 mm. broad, glabrous, stipitate ; stipe 3–4 mm. long.

Hereroland.—River Swachaub. *Marloth* 1451*.

* 1851 quoted by Baker and by Engler, but specimen from Berlin numbered 1451.

10. **C. hirsutissima** *Schinz* in Bull. Herb. Boiss. Ser. 2. 3 : 819 (1903) ; Bak. f. 409.

Branches numerous, slender, terete ascending, densely leafy and hirsute with somewhat spreading hairs. Leaves trifoliolate ; stipules leaf-like, linear, slightly falcate, 5–12 mm. long, cuneate at the base, thinly pilose ; petioles about 10–20 mm. long, flattened, hirsute ; leaflets oblanceolate or narrowly oblong-cuneate, about 10–20 mm. long, 1·5–3 mm. broad, mucronate at the apex, thinly pilose beneath, glabrous above. Flowers about 1·5 cm. long, 1–3 on slender leaf-opposed peduncles ; bracts deciduous (not seen) ; pedicels about 3–5 mm. long. Calyx about 8 mm. long, thinly pilose ; lobes narrowly deltoid, long acuminate, much longer than the tube. Standard glabrous on the back. Keels abruptly bent near the base and ending in a long straight beak, white woolly on the upper margins, glabrous on the surface. Pods oblong, about 2·5 cm. long, glabrous, stipitate ; stipe 4–5 mm. long.

South-West Africa.—Hereroland, Otavi, *Dinter* 663.

11. **C. goreensis** *Guill. and Perr.* in Fl. Seneg. 1 : 165 (1830-3) ; Bak. f. 413.

Much branched shrub ; branches straight, ascending, shortly and densely pubescent or puberulous, here and there woolly. Leaves trifoliolate ; stipules leaf-like, lanceolate-falcate, 0·6–2·5 cm. long ; petioles 1–7 cm. long, appressedly pubescent ; leaflets oblong-cuneate or oblanceolate, 1·5–7 cm. long, 0·3–2 cm. broad, sub-glabrous to densely strigose beneath, mucronate, sometimes retuse at the apex. Racemes 4 to many flowered, strictly terminal and terminal on lateral branchlets. Flowers 6–10 mm. long, rather narrow. Pedicels short, up to 3 mm. long, tomentellous ; bracts and bracteoles deciduous. Calyx about 4 mm. long : lobes deltoid, about as long as the tube, shortly pubescent. Standard glabrous. Keel bent abruptly in the lower half and ending in a long erect beak, with the upper margin shortly fringed with white hairs. Pods shortly cylindric, 12–17 mm. long, about 5–7 mm. broad, sessile, appressedly hairy.

North Rhodesia.—Mumbwa, *Macaulay* 323A ; Kafue, *Rogers* 8748.

Nyasaland.—*Whyte* no number ; *Whyte* 57.

12. **C. cylindrocarpa** *DC.* Prod. 2 : 133 (1825) ; Bak. f, 414.

Branches erect, striate to stiffly pubescent. Leaves trifoliolate ; stipules lanceolate- to ovate-falcate, 4–10 mm. long ; petiole 0·5–3 cm. long flattened, pubescent ; leaflets elliptic-oblong, rather broadly cuneate into a very short densely strigose petiolule, 1–4 cm, long, 3–11 mm. broad, sericeous-strigose beneath, becoming glabrescent. Racemes terminal, many flowered. Flowers 1–1·5 cm. long ; pedicels short, 2–3 mm. long, sericeus ; bracts deciduous ; bracteoles at base of calyx subulate. Calyx about 7 mm. long, sericeus-pubescent ; lobes deltoid acuminate, slightly longer than the tube. Standard glabrous. Keels rounded at about the middle, boat-shaped, with the upper margins fringed with long white hairs. Pods cylindric, 25–30 mm. long, shortly pubescent, sub-sessile. (Pods of the Rhodesian specimen not seen).

Rhodesia.—Mumbwa, *Macaulay* 608.

13. **C. pseudopodocarpa** *Fries* in Wiss. Ergebn. Schwed, Rhod. Kongo Exped. 1911–1912 I. 75 (1914).

A low perennial with numerous branches from the rhizome ; branches terete, simple, ascending, white-hirsute. Leaves trifoliolate ; stipules foliaceous, linear- to lanceolate-falcate, broadest about the middle, rarely a few setaceous on the same plant, 1·5–4 mm. long ; petioles 4–8 mm. long, flattened ; leaflets oblanceolate to obovate, 1–2·5 cm. long, 5–10 mm. broad, rounded at the apex with a small mucro, cuneate at the base into a petiolule, thinly appressedly pilose beneath, glabrous above. Racemes terminal and leaf opposed, Flowers 2–8, usually crowded at the apex of the peduncle, erect, about 1·5 cm. long ; bracts deciduous ; pedicels 1·3 mm. long, stout, erect. Calyx 6–8 mm. long, appressed hirsute ;

lobes deltoid, acuminate, longer than the tube. Standard glabrous on the back. Keels bent in the lower half and ending in an erect blunt beak, white woolly on the upper margins. Pods oblong, 2–2·5 cm. long, 1–1·2 cm. broad, shortly and appressedly white hirsute, stipitate ; stipe about 4 mm. long.

North East Rhodesia.—Kawendimusi, *Fries* 801.

14. **C. nigricans** *Bak.* in Oliv. Fl. Trop. Africa 2 : 21 (1871) ; Oliver in Trans. Linn. Soc. 29 : 51, tab. 26A (1872) ; Bak. f. 308

Branching suffrutex ; branches terete, shortly and patently grey pilose. Leaves trifoliolate ; stipules small, 3–5 mm. long, ovate, acuminate ; petioles 2–5 mm. long, pilose ; leaflets oblanceolate to oblong-cuneate or obovate, 1–1·5 cm. long, 4–8 mm. broad, mucronate, thinly pilose. Flowers in dense heads at the ends of the stems and short branchlets ; bracts 2–4 mm. long, ovate, acuminate. Calyx large, 8–12 mm. long, enveloping the corolla, 4-lobed almost to the base ; lobes broad, leaf-like, pilose. Keel rounded about the middle and ending in a short blunt beak. Immature pod globose, sericeus.

Nyasaland.—Fort Hill, *Whyte*.

15. **C. cephalotes** *Steud.* ex A. Rich. Tent. Fl. Abyss. 1 : 156 (1847) ; Bak. in Oliv. Fl. Trop. Africa 2 : 22 ; Hiern Cat. Welw. Africa Fl. 1 : 199 ; Bak. f. 276.

Stems erect, simple or branched, terete, pilose. Leaves trifoliolate, becoming larger and more numerous towards the apex, overtopping the inflorescence ; stipules none ; petioles pilose ; the lower 5 mm. long increasing in length upwards to 20 mm. long ; leaflets oblanceolate, about 1–4 cm. long and 2–5 mm. broad, pilose on both surfaces, mucronulate at the apex, cuneate at the base. Flowers pedicelled, about 5 mm. long, in dense terminal heads. Calyx about as long as the corolla ; lobes lanceolate, much longer than the tube. Standard hairy on the back. Keel abruptly bent below the middle and ending in a long straight beak. Pod sericeus pilose, globose, about 5 mm. in diameter.

Rhodesia.—Salisbury, *Flanagan* 3104 ; Lusaka, *Veterinary Officer* No. 2 ; Makwiro, *Mainwaring* 2212 ; Unsweswe, *Borle* 180 ; Choma, 8005 ; Broken Hill, *Rogers* 8158 ; Odanzi River Valley, *Teague* 417, Makwi o, *Mainwariug* 2212.

Nyasaland.—*Buchanan* 130 ; Shire Highlands, *Buchanan* 165 ; Lake Nyasa, *Johnson* 374 ; Kondowe to Karonga, *Whyte* 6849.

16. **C. ononoides** *Benth.* in Hook. Lond. Journ. Bot. 2 : 572 (1843) ; Bak. in Oliv. Fl. Trop. 2 : 22 ; *C. involucrata* Solander ex Bak. f. 307, name only.

Herb, branching from the base. Branches terete, pilose. Leaves trifoliolate ; stipules linear, about 5 mm. long, pilose ; petioles 3–5 mm. long, somewhat flattened, pilose ; leaflets oblong-elliptic, oblong-lanceolate, or oblong-cuneate, varying from 18–35 mm. long and 6–15 mm. broad to 45 mm. long and 6 mm. broad, usually acute, if rounded then with a small mucro, thinly pilose beneath. Flowers about 7 mm. long, pedicelled, in dense terminal heads ; bracts on the calyx linear, subulate, pilose. Calyx pilose, with long linear setaceous lobes ; lobes much longer than the tube and exceeding the corolla. Standard with a few stiff hairs near the apex on the back. Keels rounded about the middle, glabrous. Pods glabrous, sessile, 8–10 mm. long.

Rhodesia.—Mumbwa, *Macaulay* 740.

17. **C. nubica** *Benth.* in Hook. Lond. Journ. Bot. 2 : 581 (1843). *C. sphaerocarpa* var. *angustifolia*, Hochst. in Unio Inter nub. No. 282 ; Bak. f. 289. *C. nutans* Welw. ex Bak. in Fl. Trop. Africa 2 : 24 (1871) ; Bak. f. 284. *C. squarrosa* Schinz var. *Dinteri*, Bak. f. 292. *C. cernua* Schinz in Mem. Herb. Boiss. 1 : 127 (1900) ; Bak. f. 297. *C. truncata* Schinz in Mem. Herb. Boiss. 1 : 130 (1900) ; Bak. f. 298.

A squarrosely branched herb or suffrutex ; branches terete appressedly pubescent. Leaves trifoliolate ; stipules subulate to linear-lanceolate, 2–4 mm. long ; petioles 1–3 cm.

long, pubescent; leaflets linear- to lanceolate-oblong or oblong-obovate, 1–5 cm. long, 2–18 mm. broad, mostly sub-truncate at the apex and cuneate at the base, appressedly pubescent on both surfaces or glabrescent above. Racemes leaf-opposed, flexuous, usually long and laxly many flowered. Flowers small, with the keel varying from 4–8 mm. long; pedicels cernuous, 2–3 mm. long; bracts small, up to 1 mm. long; bracteoles not evident. Calyx 2–3 mm. long, pubescent; lobes acute, as long or longer than the tube. Standard thinly pubescent on the back. Keels bent almost at right angles near the base and ending in a long or short straight beak, somewhat L-shaped, thinly pubescent on the surface. Pods small, sub-spherical, up to 6 mm. long and 5 mm. broad, pubescent, sub-sessile.

Cape.—St. Claire, Douglas, Dist. Herbert, *MacOwan* 223; Kimberley, *McKenzie* in Herb. Galpin 6344, *Power* in Nat. Herb. Pretoria no number.

Orange Free State.—*Barber* no number.

Transvaal.—Bloemhof, *Burtt-Davy* 14523; Ermelo, *Pilditch in Govt. Herb. Pretoria* 6431; Barberton, *Rogers* 18503; Moorddrift, *Pott* 2189; Warmbaths, *Stent* no number, *Pott* 2066; Nylstroom, *de Jongh in Galpin Herb.* 6474; Mosdene, Naboomspruit, *Galpin* M 73; Rustenburg, *Nation* no number; Pietersburg, *Bolus* 10872; Modimolole, *Schlechter* 4263.

Bechuanaland.—Vryburg, *Mogg* 3668, *Burtt-Davy* 13740 and 13920; Mochudi, *Harbor in Herb. Rogers* 6586; Mafeking, *Burtt-Davy* 11076.

South-West Africa.—Olukonda, *Rautanen* 224, *Schinz* no number; Otjwavongo, *Schmid in Nat. Herb. Pretoria* no number; Okahandja, *Dinter* 40.

Rhodesia.—Barotseland, *Borle in Nat. Herb.* no number; Kalomo, *Rogers* 8218; Salisbury, *Mundy* 2808; Livingstone, *Rogers* 7197; Victoria, *Walters* 2257.

Portuguese East Africa.—Lourenco Marques, *Borle* 357, *Schlechter* 11665, *Kuntze* in Kew Herb. no number.

18. **C. leptoclada** *Harms* in Baum, Kunene-Sambesi Exped. 225 (1903); Bak. f. 397.

Stems many from the root, filiform, virgate, pubescent with white hairs. Leaves trifoliolate, sessile; stipules none; leaflets linear or linear oblong, 2–8 mm. long, 1–1·5 mm. broad, acute at the apex, cuneate at the base, shortly albo-pilose on both surfaces, with the upper becoming glabrescent. Peduncles lateral at the nodes, longer than the leaves and bearing usually one flower at the apex. Flower about 4–5 mm. long, red; pedicels 1·5 mm. long; bracts linear, 1 mm. long; bracteoles 2 near the apex of the peduncle, linear, 1·5 mm. long. Calyx 4 mm. long, pilose; lobes narrow, acuminate, longer than the tube. Standard glabrous, except for a few pilose hairs on the mid-rib. Keels rounded about the middle, deeply boat-shaped, scarcely beaked. Pods sub-sessile, linear-oblong, about 9 mm. long, 3 mm. broad, shortly pilose.

According to Bak. f. in Leguminosae of Tropical Africa 55 (1926), this species occurs in North-East Rhodesia. I have not seen a specimen from that area.

19. **C. sericifolia** *Harms var.* **gweloensis**, *Bak. f.*; Bak. f. 398.

Suffrutex with diffuse terete grey-tomentose branches. Leaves trifoliolate; stipules broad-based, acuminate, 2–4 mm. long; petioles 5–15 mm. long; leaflets obovate to oblong-cuneate, 2–3·5 cm. long, 7–17 mm. broad, rounded at the apex, minutely mucronate, cuneate at the base into a petiolule, silky pubescent on the under surface, glabrous and shiny on the upper. Peduncles lateral, about 3-flowered at the apex, as long as or exceeding the leaves. Flowers 8–9 mm. long, violet and yellow; pedicels about 4–5 mm. long; bracts linear, 1–2 mm. long; bracteoles 2 toward the apex of the pedicel, 1–2 mm. long. Calyx 5–7 mm. long, tomentose; lobes narrowly lanceolate, acuminate, longer than the tube. Standard densely hirsute on the back. Keels rounded about the middle, deeply boat-shaped, ending in a short blunt beak, glabrous on the surface. Pods oviform, 10–15 mm. long, 4–7 mm. broad, pubescent.

Rhodesia.—*Walters* 2258.

20. **C. hispida** *Schinz* in Bull. Herb. Boiss. ser. 2, 3 : 820 (1903) ; Bak. f. 367.

A procumbent annual ; branches hispid with stiff bulbous-based hairs. Leaves trifoliolate ; stipules linear, acuminate, 2–7 mm. long, hispid ; petioles 4–14 mm. long, grooved above, hispid with bulbous-based hairs ; leaflets elliptic-oblanceolate to oblong-cuneate, narrowing slightly at the apex into a small mucro, cuneate at the base into a petiolule, 1–4 cm. long, 3–15 mm. broad, glabrous on the upper surface, thinly hispid on the lower. Racemes leaf-opposed, about 3–12-flowered. Flowers small, 4–7 mm. long ; pedicels 1–2 mm. long, hispid ; bracts linear-subulate, about as long as the pedicels ; bracteoles 2 at the base of the calyx, appressed, linear, up to 1 mm. long. Calyx 3–4 mm. long, thinly hispid or pubescent ; lobes deltoid, about as long as the tube. Standard glabrous on the back. Keel rounded about the middle broadly U-shaped, with a short beak, or sometimes bent abruptly near the base, glabrous on the surface. Pod globose-oviform, sessile, up to 11 mm. long and 7 mm. broad, pubescent.

Transvaal.—Zoutpansberg, Messina, *Rogers* 20754a.

Rhodesia.—Victoria, *Munro* 1047 ; Wankie, *Rogers* 13304 ; Bulawayo, *Rogers* 13806.

South-West Africa.—Osona, *Dinter* 526.

21. **C. Preladoi** *Bak. f.* 367.

Annual ; branches weak, slender, thinly appressedly pilose. Leaves trifoliolate ; stipules lanceolate, acute, 2–5 mm. long ; petioles slender, grooved, 1–2 cm. long, thinly appressedly pilose ; leaflets variable in shape, narrowly oblong to linear lanceolate, 1–4 cm. long, 2–6 mm. broad, rounded and mucronate at the apex, shortly cuneate at the base, thinly appressedly pilose underneath, glabrous above. Racemes leaf-opposed, laxly many flowered. Flowers small, about 5 mm. long ; pedicels slender, 6 mm. long ; bracts linear, up to 2 mm. long ; bracteoles 2 at the base of the calyx, 1 mm. long. Calyx about 4 mm. long ; lobes deltoid-acuminate, somewhat longer than the tube, thinly appressedly pilose. Standard glabrous on the back. Keels broadly U-shaped, ending in a short beak, glabrous on the surface. Pod oviform, 9 mm. long, 6 mm. broad, sessile, pubescent.

Portuguese East Africa.—Cabaceira Grande, *Prelado* 38.

22. **C. Schinzii** *Bak.* in Journ. Linn. Soc. Bot. 42 : 370 (1914).

Small plant branching near the base ; branches slender, diffuse, hirsute, with the hairs patent or reflexed. Leaves trifoliolate ; stipules linear-lanceolate, 3–6 mm. long, hirsute on the back ; petiole 7–15 mm. long, channelled above, hirsute ; leaflets oblong-obovate, sometimes elongating, elliptic to lanceolate-elliptic, 1–4 cm. long, 5–14 mm. broad, distinctly mucronate, cuneate at the base, sub-sessile or very shortly petioluled. Racemes lateral, leaf-opposed, much exceeding the leaves, lax, many-flowered. Flowers 6–10 mm. long ; pedicels 2–5 mm. long, hirsute ; bracts cordate, small, up to 2 mm. long, persistent, reflexed ; bracteoles 2 at the base of the calyx, lanceolate, about 1 mm. long. Calyx 3–5 mm. long, hirsute ; lobes narrow, lanceolate, much longer than the tube. Standard glabrous on the back. Keels rounded about the middle, broadly U-shaped, ending in a rather short straight beak, glabrous on the surface. Pods oblong, 1–2 cm. long, 4–6 mm. broad, shortly stipitate, tomentose.

Transvaal.—Sandriver, *Schlechter* 4589 ; Messina, *Rogers* 20062, 20754 and 21860, *Pole-Evans* in Govt. Herb., Pretoria 13103.

Bechuanaland.—*Holub* no number.

23. **C. mollis** *E. Mey.* Comm. 23 (1835). Benth. in Hook. Lond. Journ. Bot. 2 : 575 ; Fl. Cap. 2 : 42 ; Bak. f. 359.

A low villose canescent plant branching at the base ; branches many, weak, trailing but turning upwards at the ends, shortly and patently villose. Leaves trifoliolate ; stipules deciduous ; petioles 5–25 mm. long ; leaflets obovate, 5–20 mm. long, 4–10 mm. broad,

villose canescent beneath, becoming glabrous above, rounded and mucronulate at the apex, sharply cuneate at the base into a small petiolule. Racemes terminal or lateral, few flowered. Flowers 10–15 mm. long; pedicels 4–6 mm. long; bracts about 2 mm. long; bracteoles inconspicuous. Calyx 5–8 mm. long, villose; lobes lanceolate, longer than the tube. Standard villose along the midrib. Keels rounded about the middle, broadly U shaped, and ending in a long sharp straight beak, glabrous on the surface. Pods oblong, somewhat inflated, 1·5–2 cm. long, about 8 mm. broad, sub-sessile, villose.

South-West Africa.—Pomona, *Dinter* 4035; Luderitzbucht, *Dinter* 3818; Gariep, *Drège* no number.

24. **C. obscura** *DC.* Prod. 2: 134 (1825), Fl. Cap. 2: 42; Bak. f. 360.

A diffuse plant branching at the base; branches decumbent, hispid with patent rufous hairs. Leaves trifoliolate; stipules linear, acute, 5–10 mm. long, hispid; petioles 1–3 cm. long, patently hispid; leaflets variable, broadly obovate or ovate to lanceolate, with an obtuse apex minutely mucronate, cuneate at the base into a petiolule, glabrescent on the upper surface, thinly pilose on the lower. Racemes terminal and leaf-opposed, 1 to several-flowered, with the flowers collected at the tops of the long peduncles. Flowers 1–1·5 cm. long; pedicels 5–8 mm. long, thinly pilose; bracts about 5 mm. long, reflexed; bracteoles at the base of the calyx conspicuous, broadly lanceolate, acuminate, 2–5 mm. long. Calyx as long as the corolla, thinly pilose-hispid to glabrescent; tube very short; lobes broadly lanceolate, acute. Standard hispid along the midrib or glabrous. Keels rounded about the middle, U-shaped, with the beak distinctly falcate, hispid on the upper margin, otherwise glabrous. Pods oblong, 2·5–4 cm. long, thinly hispid-pilose with bulbous based hairs, narrowing at the base into a short stipe.

Cape.—Between Uitenhage and Omsamvubo, inland, Salad Kraal, *Burke* and *Zeyher* no number; Beaufort, *Cooper* 252; Uitenhage, *Ecklon* 1260; Albany, *Bowker* no number; Grahamstown, *Daly* 763, *MacOwan* no number; Bathurst, *Burchell* 4051, 3776 and 3791; Keiskama, *Hutton* no number; East London, *Galpin* 3294; Transkei Baziya, *Baur* 338 and 588; Pondoland, Omsamvubo, *Drège* no number; Kokstad, *Tyson* 1885.

25. **C. lotoides** *Benth.* in Hook. Lond. Journ. Bot. 2: 575 (1843); Bak. f. 399.

A branched prostrate or decumbent suffrutex; branches terete, softly pubescent to patently pilose with yellowish hairs. Leaves trifoliolate; stipules linear-lanceolate to setaceous, 3–5 mm. long; petioles 3–20 mm. long; leaflets broadly obovate, 6–18 mm. long, 5–17 mm. broad, retuse at the apex, cuneate at the base into a small petiolule, pilose on both surfaces or the upper sometimes glabrous. Racemes leaf-opposed, bearing 1–3 flowers at the apex of the peduncle; peduncle a little longer than the subtending leaf. Flowers about 1 cm. long; pedicels 3–5 mm. long; bracts linear-lanceolate, 2–4 mm. long; bracteoles 2 at the base of the calyx, linear-lanceolate, about 2 mm. long. Calyx 6–8 mm. long, thinly and rather shortly pilose; lobes lanceolate, more than twice as long as the tube. Standard pilose along the mid-rib. Keels somewhat boat-shaped, ending in a straight blunt beak, glabrous on the surface. Pods oblong, 2–3 cm. long, 6–9 mm. broad, sub-sessile, pilose, with the hairs somewhat bulbous based.

Orange Free State.—Boshoff, *Burtt-Davy* 12895.

Transvaal.—Pretoria, Aapies River and Magliesberg, *Burke* and *Zeyher*, *Schlechter* 3684; Skinner's Court, *Burtt-Davy* 7091; Pienaars River, *Pole-Evans* no number; Kleinfontein, *Rech* in Govt. Herb. Pretoria 188; Bloemhof, *Burtt-Davy* 13029, 14307; Zeerust, *Pott* 4184; Piet Retief, *Leipoldt* no number; Potgietersrust, *Leendertz* 1288; Mosdene, *Galpin* M 71; Pietersburg, *Bolus* 11025; Zoutspanberg Mara, *Rogers* 22273; Houtbosch, *Rehmann* 6256; Lydenburg, *Rogers* 14556.

Griqualand.—Kimberley, *Flanagan* 1443, *Power* no number, *Levy* in Galpin Herb. 6337.

Bechuanaland.—Vryburg, *Burtt-Davy* 13705 and 13745, *Mogg* 8512, *Sharp* in Govt. Herb. Pretoria 7466B; Mafeking, *Greathead in Govt. Herb. Pretoria* 6387.

26. **C. gazensis** *Bak. f.* 396.

Shrub, with terete softly pubescent branches and short slender lateral branchlets. Leaves trifoliolate, sometimes drying almost black; stipules subulate from a broad base, 1–2 mm. long; petioles 2–6 mm. long; leaflets oblanceolate, 5–20 mm. long, 2–6 mm. broad, rounded at the apex, minutely mucronate, cuneate at the base into a petiolule, glabrous on the upper surface, thinly appressedly pubescent on the lower. Racemes short, 1–3-flowered, terminal and axillary on the lateral branchlets. Flowers 6–9 mm. long; pedicels 3–5 mm. long; bracts subulate, 1–2 mm. long; bracteoles 2, about midway on the pedicels, very small. Calyx 5–7 mm. long, appressedly pubescent; lobes narrowly deltoid, longer than the tube. Standard glabrous, glaucous. Keels U-shaped, broad, with the upper margin somewhat hyaline and 2-lobed; beak very short. Pod 20–22 mm. long, densely villose.

Transvaal.—Wylies Poort, *Breyer* 19421.

Gazaland.—Nyabodi River, *Swynnerton* 1493.

27. **C. excisa** *Bak. f.* in Journ. Linn. Soc. Bot. 42: 394 (1914). *C. humilis E.* and *Z.*, *C. diffusa E. Mey.*, *C. effusa E. Mey.*, ex parte. *Lotononis diffusa E.* and *Z. Lotononis perplexa E.* and *Z. Ononis excisa Thunb.*

A small slender diffuse plant branching from the base; branches less than 1 mm. in diameter near the base, appressedly pubescent. Leaves trifoliolate; stipules small, subulate, recurved, 1–2 mm. long; petioles 5–12 mm. long, appressedly pubescent; leaflets obovate, narrowly oblong to almost linear, 7–15 mm. long, 2–8 mm. broad, rounded at the apex and sometimes retuse, minutely mucronate, cuneate at the base into a minute petiolule, glabrous above, appressedly pubescent beneath. Flowers 1–2 in upper half of long leaf-opposed peduncles, 8–12 mm. long; peduncles usually more than twice as long as the subtending leaf, 3–7 cm. long, appressedly pubescent; pedicels 2–6 mm. long; bracts 1·5 mm. long; bracteoles 2, very small, at the base of the calyx. Calyx 5–9 mm. long, appressedly pubescent; lobes narrow-deltoid, acute, longer than the tube. Standard glabrous on the back, sometimes with a few hairs on the mid-rib. Keels rounded about the middle, U-shaped, ending in a sharp straight beak, glabrous on the surface. Pods narrowly oblong, 10–20 mm. long, 3–5 mm. broad, sub-sessile, thinly appressedly pubescent.

Cape.—Near Capetown, *Bolus* 2998, *Pappe* no number, *Bowie* no number, *Macowan* 1832, *Ecklon* 225; Lions Head, *Wolley Dod* 1345; Rosebank, *Pillans* 3475; Montagu Baths, *Page* 49; Hopefield, *Bolus* 12664; Karee Bergen, *Schlechter* 8226; Kamiesberg, *Pearson* 6768.

Very near *C. effusa* but has more than 2 flowers and is a much more slender plant comparatively.

28. **C. effusa** *E. Mey.* Comm. 25 ex parte (1835).

Ononis racemosa Thunb. Fl. Cap. 587 (1823); Bak. f. 395.

A low diffuse plant copiously branched from the base, thinly appressedly pubescent; branches terete, slender, a little over 1mm. in diameter near the base, thinly pubescent or glabrescent. Leaves trifoliolate; stipules subulate, 1–2·5 mm. long; petioles 5–20 mm. long, glabrescent or thinly appressedly pilose; leaflets obovate to very narrowly oblong, 6–15 mm. long, 3–10 mm. broad, rounded at the apex, sometimes retuse, minutely mucronate, cuneate at the base into a small petiolule, glabrous above, thinly appressedly pubescent beneath. Racemes leaf-opposed; flowers 3 to several in the upper half of the rather weak peduncles; peduncles 5–10 cm. long, thinly appressedly pubescent to glabrescent. Flowers 10–15 mm. long; pedicels 3–6 mm. long; bracts linear, acute, 1–2 mm. long; bracteoles minute, about midway on the pedicel. Calyx 6–10 mm. long, thinly and shortly appressedly pubescent with whitish hairs; lobes narrowly deltoid, as long or longer than the tube.

Standard glabrous on the back. Keels rounded about the middle, broadly U-shaped, ending in a straight beak. Pods about 2·5 cm. long and 6 mm. broad, stipitate, appressedly pubescent.

Cape.—*Drège* ; Olifants River Valley, near Warm Bath, *Stephens* 7105 ; Little Namaqualand, near Klipfontein, *Bolus* 432 and 6552.

29. **C. axillaris** (*Dryand* in) *Aiton*, Hort. Kew. 3 : 20 (1789).

C. Hildebrandtii Vatke in Oest. Bot. Zeit. 29 : 220 (1879). *C. lotifolia Baker* in Fl. Trop. Africa 2 : 42. Bak. f. 388.

Shrubby, with long straight puberulous branches. Leaves trifoliolate ; stipules none ; petioles 3–8 cm. long, about as long as the terminal leaflets, puberulous ; leaflets oblong or elliptic, with the terminal obviously larger than the lateral, 3–9 cm. long, 1·5–3·5 cm. broad, rounded or acute, apiculate, cuneate at the base into a distinct petiolule, glabrous above, thinly puberulous beneath. Flowers axillary, usually 2 in the leaf-axil, 1·5–2 cm. long ; pedicels 1·2–1·5 cm. long, puberulous, not bracteolate. Calyx 1·2–1·4 cm. long, puberulous ; tube short and wide, lobes long acuminate, much longer than the tube. Standard glabrous on the back except for a few hairs on the mid-rib. Keels U-shaped ending in a long straight beak, glabrous on the surface. Pods oblong, cuneate, about 5 cm. long, stipitate, puberulous.

Nyasaland.—*Buchanan* 289 ; 731 ; Zomba, *Manning* 12 ; *Whyte* no number ; Shire Highlands, *Buchanan* 83 ; *Adamson* 266.

30. **C. agatiflora** *Schweinf.* in von Hohnel zun Rudolph und Stephanie. See Anhang 13 (1892) ; Bot. Mag. t. 8505 ; Bak. f. 315.

Erect shrubs ; branches villose or glabrescent and glaucous. Leaflets trifoliolate ; stipules none or deciduous ; petioles 3–8 cm. long, villose or glabrescent, herbaceous, fistular, usually longer than the leaflets ; leaflets elliptic, ovate- or obovate-elliptic, 3–9 cm. long, 1·5–3·5 cm. broad, shortly petioluled, glabrous or villose beneath. Racemes long, robust, terminal and lateral. Flowers 4–5 cm. long ; bracts deciduous ; pedicels about 1·5 cm. long, glabrous-glaucous or villose, bi-bracteolate near the base ; bracteoles small, filiform. Calyx 2–2·5 cm. long ; lobes longer than the tube, with the 4 upper connate in pairs and the lower narrow and more acuminate, glabrous-glaucous or villose. Standard glabrous on the back or villose along the mid-rib. Keels rounded, almost boat-shaped, ending in a long straight beak, glabrous on the surface. Pods 6–7 cm. long, 2–2·5 cm. broad, narrowing at the base into a long stipe, glabrous.

Common in East Trop. Africa and cultivated in South Africa and elsewhere. In Nat. Herb. Pretoria, *Le Mare* no number ; *Starke and Co.* no number.

31. **C. australis** *Bak. f.* MS. *C. petiolaris Franch. var. australis* Bak. f. 319.

A much-branched shrub with virgate glabrous faintly ribbed branches. Leaves glabrous, trifoliolate ; stipules none ; petioles 4–8 cm. long, herbaceous, numerous, suberect, much exceeding the leaflets ; leaflets narrowly oblong to oblong cuneate, 1·5–5 cm. long, 3–30 mm. broad, retuse and mucronulate at the apex, somewhat cuneate at the base into a short petiolule. Racemes usually many flowered, leaf-opposed, long, appearing terminal. Flowers large, about 2 cm. long ; bracts subulate ; pedicels slender, about 7–14 mm. long. Calyx glabrous, 9–14 mm. long ; lobes acuminate, acute, longer than the tube. Standard glabrous on the back. Keel deeply rounded about the middle and ending in a straight truncate beak, glabrous on the surface. Pod long stipitate, brown, often with dark red flecks, narrowly cylindric, long cuneate at the base, about 6–8 cm. long and 10–12 mm. wide ; stipe about half as long, 3–4 cm. long.

Transvaal.—Pretoria, *Pole Evans* no number ; Pienaars River, *Schlechter* 4210, Barberton, *Rogers* 2053 and 20257, *Galpin* 914 ; Waterberg, *Galpin* M 72 ; Pietersburg, *Bolus* 10875 ; Klein Letaba, *Junod* 1527 ; Messina, *Rogers* and *Moss* 70.

32. **C. laburnifolia** *Linn.* Sp. Pl. 715 (1753); Bak. f. 318.

Erect shrubs, branched; branches somewhat glaucous, glabrous. Leaves trifoliolate; stipules none; petioles 2·9 cm. long, mostly much longer than the leaflets, herbaceous, glabrous; leaflets oval, elliptic or obovate-oblong, 1·5–7 cm. long, 0·5–4 cm. broad, broadly acuminate at the apex, rarely rounded or retuse, mucronate, shortly petioluled, usually glabrous. Flowers large, about 3 cm. long, in lax many flowered racemes: bracts subulate; pedicels slender, 1–2·5 cm. long. Calyx 1–1·5 cm. long, wide at the mouth, glabrous; lobes deltoid, acuminate, longer than the tube, with the lateral approaching each other, and the lower narrower and somewhat longer. Standard glabrous. Keels rounded about the middle, broadly U-shaped, ending in a truncate beak, glabrous on the surface. Pod long-stipitate, cylindric, 3·5–4·5 cm. long, 12–14 mm. broad, glabrous; stipe up to 2 cm. long.

Transvaal.—Gold Fields, *Baines* 1870; Barberton, *Rogers* 20305.

Rhodesia.—Victoria Falls, *Allen* 125, *Munro* 1760; Livingstone, *Rogers* 5612.

Portuguese East Africa.—Mocambique, *Johnson* 252.

Nyasaland.—Shire Highlands, *Buchanan* 981.

33. **C. longidens**, *Burtt-Davy*.*

A glabrous shrub; branches terete, somewhat glaucous. Leaves trifoliolate; stipules small, hardened and breaking off at the base; petioles rather swollen, about 2·4 cm. long; leaflets shorter than the petiole, obovate to narrowly oblong, cuneate, 1–3 cm. long, 3–17 mm. broad, minutely mucronate, very shortly and slenderly petioluled at the base. Racemes leaf-opposed, short, with few flowers (the peduncle more or less zigzag). Flowers about 2 cm. long; bracts about 5 mm. long, lanceolate, acuminate into a sharp point, the whole becoming hard and thickened, almost spinous; pedicels slender, about 1 cm. long. Calyx glabrous, about 1·5 cm. long, 5-lobed; lobes longer than the tube and acuminate into a hard subulate point at the apex, with the lowest lobe narrower and longer than the rest. Keels rounded about the middle, ending in a blunt beak, glabrous on the surface. Immature pod long stipitate, glabrous.

Transvaal.—Houtbosch, *Rehmann* 6257; Pietersburg, *McCallum* 137.

34. **C. athroophylla** *Verdoorn* n.sp.

Shrub or small tree, with the branches, petioles and racemes appressedly grey pilose. Leaves trifoliolate; stipules none; petioles much longer than the leaflets, 1·5–5·5 cm. long; leaflets linear to oval or obovate-elliptic, 1–5 cm. long, 2–8 mm. broad, rounded and very minutely mucronate at the apex, shortly petioluled. Racemes leaf-opposed towards the apex of the branches, several flowered, grey pilose. Flowers 1·5–2 cm. long; bracts subulate; pedicels 6–10 mm. long. Calyx appressedly pilose, 10–12 mm. long, 5-lobed; lobes deltoid, about as long as the tube. Pods thinly grey tomentose, about 3 cm. long, stipitate; stipe about 1 cm. long.

Rhodesia.—Salisbury, *Eyles* 1330 (type), *Eyles* 681; Marandellas, *Eyles* 3873; no locality, *Walters* 2235.

C. athroophylla, *Verdoorn* sp. nov.

Suffrutex, ramis, petiolis racemisque appresse griseo-pilosis. Folia trifoliolata, petiolata, foliolis linearibus, ovalis, vel obovato-ellipticis, 1–5 cm. longis, 2–3 mm. latis, quam petiolis brevioribus. Stipulae nullae. Pedunculi oppositifolii, pauci-vel pluri-flori. Flores 1·5–2 cm. longi. Bracteae subulatae. Pedicelli 6–10 mm. longi. Calyx appresse pilosus, 10–12 mm. longus, 5-lobatus, lobis triangularibus quam tubo equilongis. Legumen grisso-tomentosum, circiter 3 cm. longum, stipitatum.

* This will be published by Dr. J. Burtt-Davy in the next volume of his "Manual of the Flowering Plants of the Transvaal," which is ready for press. Wherever Burtt-Davy is cited as the author of a species or variety the same applies.

35. **C. rigidula** *Bak. f.* in Journ. Bot. 58 : 75 (1920). *C. Breyeri, N.E. Br.* in Kew Bull. (1922), p. 27.

A slender shrub with short spiky branchlets, the young parts thinly strigose-pubescent. Leaves trifoliolate ; stipules none ; petioles 6–15 mm. long ; leaflets oblanceolate to oblong-obovate, 5–15 mm. long, 3–4 mm. broad, mucronate or retuse at the apex, cuneate at the base, strigose pubescent beneath, minutely petioluled. Racemes lateral, few-flowered. Flowers about 12–20 mm. long ; pedicels 3–7 mm. long ; bracts about 2 mm. long ; bracteoles 2 near the apex of the pedicels, about 1 mm. long. Calyx 6–7 mm. long, thinly strigose or glabrescent ; lobes deltoid, about as long as the tube. Standard glabrous on the back. Keels rounded somewhere about the middle, glabrous on the surface. Pods about 3 cm. long, including the stipe, appressedly pubescent ; stipe up to 5 mm. long.

Transvaal.—Tzaneen, *Rogers* 12531 ; Pietersburg, *Breyer* in Herb. *Rogers* 23998 ; Salati, *Breyer* no number.

36. **C. Monteiroi** *Taubert* ex Bak. f. in Journ. Linn. Soc. Bot. 42 : 387.

Much branched shrub ; branchlets stout, woody, shortly grey tomentellous. Leaves 3-, rarely 4-foliolate ; stipules small or absent ; petioles 4–12 mm. long ; leaflets obovate, 6–12 mm. long, 2–9 mm. broad, broadly rounded or retuse at the apex, minutely mucronate, cuneate at the base into a very small petiolule, appressedly pubescent, becoming glabrous above. Racemes 1 to few-flowered, short, leaf-opposed and terminal. Flowers 1·5–2 cm. long ; pedicels 4–6 mm. long ; bracts tomentose, 1 mm. long ; bracteoles very small, 2, about midway or in lower half of the pedicel. Calyx about 7 mm. long, shortly appressedly pubescent ; tube wide at the mouth ; lobes broadly deltoid, as long or shorter than the tube. Standard glabrous on the back. Keels rounded about the middle, boat-shaped or broadly U-shaped, ending in a short rather blunt beak, glabrous on the surface. Pods oblong-cuneate, about 2·5 cm. long, 7 mm. broad, appressedly pubescent, stipitate.

Portuguese East Africa.—Delagoa Bay, *Monteiro* 18, *Speke* 5, *Scott* no number, *Bolus* 7712, *Schlechter* 11541.

Rhodesia.—Kalomo, *Rogers* 7712.

var Galpinii, *Burtt-Davy.*

Leaflets obovate to oblong cuneate, 10–30 mm. long, 3–12 mm. broad. Bracts at base of flowers 2–4 mm. long.

Portuguese East Africa.—Lourenco Marques, *Rogers* 11810.

Natal.—*Gerrard* 1091 ; Pietermaritzburg, *Wilms* 1929.

Transvaal.—Barberton, *Galpin* 1068.

37. **C. Pearsonii** *Bak. f.* 342.

An erect perennial ; branches strigose with conspicuous white hairs. Leaves trifoliolate ; stipules none ; petioles 1–1·5 cm. long, thinly white strigose ; leaflets ovate-cuneate to obovate, 6–12 mm. long, 3–6 mm. broad, rounded at the apex, distinctly petioluled at the base, glabrous on the upper surface, strigose with conspicuous white hairs on the lower. Racemes lax, terminal. Flowers about 10–12 mm. long ; pedicels 3–5 mm. long, white strigose ; basal bract about 2 mm. long ; bracteoles smaller near the base of the calyx. Calyx 5–7 mm. long ; lobes lanceolate, rather blunt, slightly longer than the tube. Standard glabrous on the back. Keels rounded abruptly about the middle, ending in a straight beak, glabrous on the surface. Pods (immature) about 12 mm. long, thickly white pubescent, stipitate.

Namaqualand.—Doornpoort Ravine, *Pearson* 6131.

38. **C. harmsiana** *Taubert* in Engl. Pflanzenwelt Ost. Africa C.205 (1895) ; Bak. f. 397.

A suffrutex with numerous lateral branchlets, hirsute to pilose. Leaves trifoliolate, sessile or sub-sessile ; stipules none ; petiole rarely up to 2 mm. long ; leaflets oblanceolate, with the lateral oblique and rounded on one side and the terminal cuneate at the base, 5–15 mm. long, 1·5–4 mm. broad, rounded at the apex and mucronate, with the margins distinctly revolute, pilose on both surfaces, sometimes becoming glabrescent. Flowers 1 to several at the ends of the lateral branchlets, 7–9 mm. long ; pedicels 2–4 mm. long ; bracts linear, 2–4 mm. long ; bracteoles 2 at the base of the calyx, linear, 2–4 mm. long. Calyx 5–7 mm. long, pilose ; lobes narrowly deltoid, acuminate, much longer than the tube. Standard pilose on the back towards the apex. Keels U-shaped, ending in a short blunt beak, glabrous on the surface. Pods narrow oblong, about 15 mm. long, 5 mm. broad, sub-sessile, pilose.

Nyasaland.—Bandowe, *Scott* no number.

39. **C. Doidgeae** *Verdoorn* n. sp.

A suffrutex, with the young branches appressedly or somewhat spreading pubescent. Leaves trifoliolate ; stipules none ; petioles 1·5–5 cm. long, about as long as the leaflets, pubescent ; leaflets elliptic to obovate-cuneate, 2–6 cm. long, 7–20 mm. broad, rounded at the apex, with a distinct pubescent mucro, cuneate at the base and distinctly petiolulate, appressedly pubescent, especially on the under surface, becoming glabrous on the upper, dark in colour. Racemes terminal or leaf-opposed, few to several-flowered. Flowers 1·5–2 cm. long ; bracts long setaceous, deciduous ; bracteoles 2, about midway on the pedicels, deciduous ; pedicels 7–10 mm. long, pubescent. Calyx about 1·5 cm. long, sericeus pubescent ; lobes attenuated into long setaceous tips, much longer than the tube. Standard sericeus pubescent on the back. Keels rounded about the middle, ending in a short beak, pubescent on the surface near the lower margins. Pod oblong, about 4 cm. long and 1·5 cm. broad, pubescent, long stipitate ; stipe about 1·5 cm. long.

Transvaal.—Potgietersrust, *Doidge* (type) ; Lydenburg, *Rogers* 14591.

C. Doidgeae *Verdoorn* sp. nov.

Suffrutex, ramis appresse vel patule pubescentibus. Folia trifoliolata, petiolata, foliolis ellipticis vel obovato-cuneatis, 2–6 cm. longis, 7–20 mm. latis, appresse pubescentibus. Stipulae nullae. Racemi terminales vel oppositifolii, pauciflori. Flores 1·5–2 cm. longi. Bracteae longae, lineares. Pedicelli 7–10 mm. longi, pubescentes. Calyx 1·5 cm. longus, lobis longe attenuatis, quam tubis longioribus. Vexillum extus sericeo-pubescens. Carina dorso rotundata, pubescens. Legumem oblongum, 4 cm. longum, 1·5 cm., latum, pubescens, longe stipitatum.

40. **C. Ceciliae** *Verdoorn* n. sp.

Suffrutex with softly pubescent branches becoming quite glabrous. Leaves trifoliolate ; stipules none ; petioles 1–5 cm. long, pubescent or glabrous ; leaflets elliptic to lanceolate or ovate-acuminate, 2–7 cm. long, 6–24 mm. broad, acuminate to the acute apex, cuneate at the base into a small petiolule, thinly appressedly pubescent, becoming glabrous. Racemes terminal or leaf-opposed, with a few large flowers. Flowers 2–2·5 cm. long ; bracts about 4 mm. long, linear-subulate ; bracteoles 2, on the pedicels, smaller than the bracts ; pedicels 7–12 mm. long, pubescent, becoming glabrous towards the apex. Calyx about 1·5 cm. long, glabrescent ; lobes deltoid, long acuminate, longer than the tube. Standard glabrous on the back or with only a very few hairs. Keels rounded about the middle, broadly U-shaped and ending in a distinct beak, glabrous on the surface. Pod not seen.

Portuguese East Africa.—Between Beira and Messi Kessi, *Cecil* no number. Type ! (Also Tanganyika, Kyimbila, *Stolz* 641).

C. Ceciliae *Verdoorn* sp. nov.

Suffrutex, ramis molliter pubescentibus tandum glabris. Folia trifoliolata, petiolata, foliolis acutis, ellipticis lanceolatis vel ovato-acuminatis 2–7 cm. longis, 6–24 mm. latis, pubescentibus vel glabris. Stipulae nullae. Racemi terminales vel oppositifolii. Flores pauci, 2–2·5 cm. longi. Bracteae lineares, 4 mm. longae. Pedicelli 7–12 mm. longi, pubescentes apicem versus glabri. Calyx 1·5 cm. longus, glabrescens, lobis triangulari-acuminatis quam tubo longioribus. Vexillum glabrum vel sparse pilosum. Carina dorso rotundata, glabra.

41. **C. purpurea** *Vent.* Jard. Malm. t. 66 (1804); Bak. f. 358.

A shrub or small tree. Branches terete, appressedly pubescent. Leaves trifoliolate; stipules small or none; petioles 5–20 mm. long, appressedly pubescent; leaflets obovate or oblong cuneate, rounded at the apex, with a minute mucro, cuneate at the base and distinctly petioluled, appressedly pubescent beneath, glabrous above. Racemes terminal on the branchlets, many flowered. Flowers 1–1·7 cm. long; bracts linear, acute, about 7mm. long, soon falling off and leaving a scar; bracteoles near the apex of the pedicels, similar to the bracts; pedicels 4–10 mm. long. Calyx 4–7 mm. long, appressedly pubescent; tube wide, truncate at the base and intruse; lobes shorter than the tube, with the two upper truncate at the apex and the three lower deltoid acute. Corolla purple. Standard glabrous on the back. Keels more or less boat-shaped, ending in a very blunt beak, glabrous. Pods about 3 cm. long, 1·5 cm. broad, stipitate, glabrous; stipe 6–10 mm. long.

South Africa.—Without locality, *Burchell* 5792, *Drége* no number, *Zeyher* 229.

Cape.—Garcias Pass, *Phillips* 349; Genadendal, *Prior*; Georgetown, *Prior*; Knysna, *Tyson* 982.

This species approaches the genus *Hypocalyptus* but differs in having the inflated pod of *Crotalaria* and should therefore remain in that genus.

42. **C. Barnabassii** *Dinter* ex Bak. f. Journ. Linn. Soc. Bot. 42 : 356.

Branches many, slender, faintly striate and thinly strigose, glaucous green. Leaves trifoliolate; stipules subulate, up to 2 mm. long, deciduous; petioles 1·5–3·5 cm. long, narrowly grooved above; leaflets lanceolate-oblong, 1·5–6 cm. long, 4–10 mm. broad, rounded or sub-truncate at the apex, abruptly cuneate into a petiolule at the base. Racemes many, terminal and leaf-opposed, lax. Flowers 10–13 mm. long; pedicels 2–5 mm. long, grey strigose, bi-bracteolate near the apex; bracts subulate, 1–2 mm. long; bracteoles smaller. Calyx 5–7 mm. long, glauco-glabrescent; lobes lanceolate to deltoid, about as long as the tube. Standard glabrous on the back. Keels rounded about the middle, broadly U-shaped, with the beak short and sharp, glabrous on the surface. Pods oblique oviform, up to 2 cm. long and 1·3 cm. broad, thinly strigose to glabrous, stipitate; stipe about 1 cm. long.

Rhodesia.—Victoria Falls, *Rogers* 13463.

South-West Africa.—Okahandja, *Dinter* 490.

43. **C. recta** *Steud.* ex A. Rich. Tent. Fl. Abyss. 1 : 152 (1847); Bak. f. 352.

An erect suffrutex; branches rather stout, distinctly hollow, longitudinally grooved, pubescent in the younger parts. Leaves trifoliolate; stipules linear, acuminate, 4–6 mm. long, petioles 1·5–4·5 cm. long, pubescent, grooved above; leaflets unequal with the terminal sensibly larger than the lateral, obovate or oblong, cuneate, 2·5–9 cm. long, 1–4 cm. broad, mucronate, long cuneate at the base into a petiolule, glabrous on the upper surface, appressedly pubescent on the lower. Racemes terminal, many flowered. Flowers 1·2–1·8 cm. long; pedicels 5–10 mm. long, densely pubescent, becoming glabrescent towards the apex, bi-bracteolate about mid-way; bracts linear-lanceolate, acuminate, 6–12 mm. long, reflexed; bracteoles setaceous, up to 3 mm. long. Calyx 1–1·3 cm. long, glaucous, glabrescent; the lobes deltoid, about as long as the tube. Standard glabrous on the back.

Keels rounded about the middle, almost U-shaped, broad with a very short beak, fringed on the margins, otherwise glabrous. Pods oblong, about 3–5 cm. long, and up to 2 cm. broad, shortly stipitate, somewhat glaucous

Transvaal.—Lydenburg, *Rogers* 18662, 14675 and 23745 : Waterval Boven, *Mason* 41 ; Rogers 14459 ; Barberton, *Galpin* 845 ; Pietersburg, *McCallum* 137 ; Shilouvane, *Junod* 2316 ; Zoutpansberg, Malta *Junod* 4456.

Rhodesia.—Umtali, *Teague* 208 ; Chirinda, *Swynnerton* 365.

Nyasaland.—Zomba, *Sharp* 115 ; Massiku Plateau, *Whyte* no number.

44. **C. lanceolata** *E. Mey.* Comm. 24 (1835), Benth. in Hook. Lond. Journ. Bot. 2 : 585 ; Fl. Cap. 2 : 43 ; *C. mossambicensis Klotsch* in Peters' Mosamb., Bot. 61, t. 10 ; Bak. f. 343 ; *C. cleomoides Klotsch* in Peters' Mosamb., Bot. 1 : 59 (1862) ; Bak. f. 247.

Stems erect branching ; branches virgate, somewhat grooved towards the apex, shortly pubescent to glabrescent. Leaves trifoliolate ; stipules none ; petioles 1·5–5 cm. long, shortly appressedly pubescent ; leaflets lanceolate, linear-lanceolate or oblong, 2–12 cm. long, 4–17 mm. broad, mucronulate at the apex, very shortly petioluled at the base, glabrous on the upper surface, thinly strigose on the under. Racemes terminal, long, many flowered. Flowers 6–11 mm. long ; pedicels 4–9 mm. long, strigose pubescent ; basal bracts acute, about 1 mm. long. Calyx-tube 3–5 mm. long, strigose pubescent to glabrescent, 5-toothed ; teeth acute, shorter than the tube. Standard glabrous on the back. Keels more or less boat-shaped, shortly and bluntly beaked, glabrous on the surface, ciliate near the base. Pods cylindric, 3–4 cm. long, appressedly pubescent, sub-sessile.

Cape.—Port St. Johns, *Flanagan* 2599.

East Griqualand.—near Clydesdale, *Tyson* 2757

Zululand.—Egoa, *Curson* 255.

Natal.—Port Shepstone, *Mogg* no number ; between Omsamculo and Omcomas River, *Drège* 1836 ; Umcomanzi, *Schlechter* 6697 ; Clairmont, *Kuntze* ; Port Natal, *Krauss* 469 ; Inanda, *Wood* 99 ; Dist. Alexandra, *Rudatis* 209 ; Durban, *Wood* 249.

Transvaal.—Carolina, *Rogers* 18390 ; Barberton, *Potts* 5336, *Rogers* 25522, 20782 and 20072 ; Pietersburg, *Rogers* 12475

Rhodesia.—Salisbury, *Eyles in Herbarium S. Rhodesia* No. 3317 ; Umtali, *Teague* 223.

Portuguese East Africa.—Mozambique, *Peters* no number ; *Peters* no number ; Sena, *Kirk* no number ; Tette, *Kirk* no number ; Siluvu Hills, *Honey* 805 ; Lourenço Marques, *Borle* 280 ; Vila Pery, *Esselen* no number.

Nyasaland.—Shire Highlands, *Buchanan* 356 ; *Adamson* 327.

45. **C. intermedia** *Kotschy* in Sitzungsb. Akad. Wien. (1864) 362, t. 3 ; Bak. f. 327.

Erect sparingly branched suffrutex ; branches virgate, striate, pubescent. Leaves trifoliolate ; stipules 0 ; petioles 1–4 cm. long ; leaflets narrowly oblong, variable, 2·5–10 cm. long, 4–10 mm. wide, minutely mucronate at the apex, shortly petioluled at the base, glabrous on the upper surface, thinly hairy on the lower. Racemes terminal, sometimes much elongated. Flowers 1·5–2·5 cm. long ; pedicels 3–5 mm. long, pubescent ; bracts not half as long as the pedicels ; bracteoles at the base of the calyx, small. Calyx about 7mm. long, glabrous ; lobes deltoid, very acute, shorter than the tube. Standard glabrous on the back. Keel rounded about the middle, boat-shaped, glabrous. Pod oblong-cylindric, about 3–5 cm. long, 1·3–1·6 cm. broad, pubescent, becoming glabrescent.

Rhodesia.—Victoria Falls, *Rogers* 13126 ; Salisbury, *Eyles* 2118 ; *Munday* no number ; Broken Hill, *Rogers* 8062 ; Kafue River Bridge, *Rogers* 8751.

46. **C. simplex** *A. Rich.* Tent. Fl. Abyss. 1 : 153 (1847) Bak. f. 353, pro. subsp. *C. recta.*

An erect suffrutex with rather stout distinctly hollow branches, shortly pubescent. Leaves trifoliolate ; stipules linear-acuminate, about 10 mm. long, reflexed ; petioles 4–6 cm. long, grooved above ; leaflets lanceolate or linear-lanceolate acuminate, 9–24 cm. long, 7–17 mm. broad, acuminate, mucronate, cuneate at the base into a short petiloule, glabrous on the upper surface, appressedly pubescent on the lower. Racemes terminal, many flowered. Flowers 1·5–1·8 cm. long ; pedicels 7–10 mm. long, pubescent with stiff yellow hairs in the lower half, becoming glabrous towards the apex, bi-bracteolate about mid-way ; bracts linear-lanceolate, acuminate, 5–12 mm. long, reflexed. Calyx 10–12 mm. long, glabrescent ; lobes deltoid, as long as or shorter than the tube. Standard glabrous on the back. Keels rounded about the middle, almost U-shaped, with a short beak, ciliate on the margins, otherwise glabrous. Pods about 5 cm. long, shortly stipitate, glabrous.

Nyasaland.—Shire Highlands, *Buchanan* 433 and 144.

47. **C. vasculosa** *Wallich* Cat. No. 5427, ex Benth. in Hook Lond. Journ. Bot. 2 : 584 (1843) ; Bak. f. 279.

Stems herbaceous, erect ; branches virgate, densely pilose. Leaves trifoliolate ; stipules setaceous, about 3–5 mm. long, pilose ; petioles consistently short, about 3–6 mm. long, grooved above, pilose ; leaflets variable in shape, mostly oblong-elliptic to elliptic, about 2·5–9 cm. long, 0·5–2·5 cm. broad, pilose on both sides, mucronate, cuneate at the base. Racemes terminal, elongate, cylindric ; sometimes overtopped by the upper leaves. Flowers crowded, about 7 mm. long. Pedicels short, about 2 mm. long, cernuous ; bracts and bracteoles setaceus. Calyx shorter than the corolla, more or less glabrous, with lanceolate long pilose lobes ; lobes as long as or longer than the tube. Standard glabrous. Keel evenly rounded about the middle and ending in a sharp straight beak, margins shortly fringed in parts. Pod oblong or more or less globose when young, 6–18 mm. long, densely brown pilose.

Nyasaland.—*Buchanan* 1190 ; Nyika, *Wakefield* 931 ; Likoma, *Riddelsdell* 25.

This species was founded upon a cultivated specimen collected by Wallich, No. 5427, in Mauritius.

48. **C. Schlechteri** *Bak. f.* in Journ. Linn. Soc. Bot. 42 : 365 (1914).

An erect shrub ; branches terete, softly appressedly pubescent. Leaves trifoliolate ; stipules linear, acute, 4–6 mm. long, deciduous ; petioles 5–10 mm. long, pubescent ; leaflets obovate, 2–4 cm. long, 1–2 cm. broad, mucronate, cuneate at the base into a small petiolule, densely appressedly pubescent beneath, glabrescent above. Racemes short, leaf-opposed. Flowers 7–10 mm. long ; bracts subulate, up to 2 mm. long ; bracteoles ovate, at base of the calyx, deciduous ; pedicels 2–4 mm. long. Calyx 3–5 mm. long, pubescent ; tube wide at the mouth ; lobes deltoid, acuminate, rather shorter than the tube. Standard glabrous or shortly and thinly pubescent on the back. Keels rounded about the middle, broadly U-shaped, narrowing gradually to a short blunt beak, glabrous on the surface. Pods oblong, 2·5 mm. long, sub-sessile (from description).

Portuguese East Africa.—Incanhiri, *Schlechter* 12037.

49. **C. lachnocarpoides** *Engl. var.* **valida** *Verdoorn. C. valida Bak. C. lachnocarpoides Engl.*, subsp. *valida* Bak. f. 323.

An erect shrub ; branches densely pubescent. Leaves trifoliolate ; stipules setaceous, up to 5 mm. long, deciduous ; petioles erect, 3–10 mm. long, densely pubescent ; leaflets lanceolate to oblong-cuneate, 3–6 cm. long, 6–17 mm. broad, acute and apiculate at the apex, cuneate at the base into an obscure petiolule, densely hairy on both surfaces. Racemes terminal or leaf-opposed, few flowered. Flowers about 1·5 cm. long ; pedicels 5–8 mm. long ; basal bract almost the same length ; bracteoles 2. Calyx about as long as the flower, densely ferrugineous pubescent, deeply 5-lobed ; lobes lanceolate. Standard

thinly to densely hairy on the back. Keels bent about the middle, boat-shaped, sometimes covered with long golden hairs, with the short beak glabrous. Pod about 2 cm. long, densely and shaggily ferrugineous pilose.

Nyasaland.—Between Kondowe and Karonga, *Whyte* 373 ; Kyimbila, *Stolz* 233 and 2360 ; Shire Highlands, *Buchanan* 322, *Adamson* 280.

50. **C. amoena** *Welw.* ex Bak. in Fl. Trop. Africa 2 : 26 (1871); Hiern Cat. Welw. Afr. Pl. 1 : 200; Bak. f. 355.

A shrubby plant ; branches shortly grey tomentose. Leaves trifoliolate ; stipules subulate, up to 3 mm. long ; petioles stout, up to 3 mm. long ; leaflets oblong or elliptic, 2–6 cm. long, 7–22 mm. broad, mucronate, shortly petioluled, glabrous on the upper surface except on the midrib, densely appressedly pubescent on the lower surface. Racemes terminal and axillary, short, few flowered. Flowers about 12 mm. long ; pedicels 4–7 mm. long, tomentose ; bracts linear, acute, 4–6 mm. long ; bracteoles smaller at the base of the calyx. Calyx 10 mm. long, smoothly closely tomentose ; lobes lanceolate, acute, slightly longer than the tube. Standard silky tomentose on the back. Keels rounded about the middle, broadly U-shaped, with a short beak, glabrous or tomentose in the lower exposed half, ciliate on the margin. Pods (immature) oblong, silky tomentose.

Rhodesia.—Kambola, *Nutt* no number.

51. **C. dura** *Wood* and *Evans* in Journ. Bot. 35 : 487 (1897) ; Bak. f. 295.

Virgate shrubs ; branches faintly striate and thinly strigose. Leaves trifoliolate ; stipules small, subulate, recurved, sometimes absent ; petioles 3–10 mm. long, grooved above ; leaflets narrowly oblong-cuneate or oblanceolate, 10–32 mm. long, 3–8 mm. broad, acute, mucronate or retuse, cuneate at the base, thinly appressedly pubescent. Flowers 6–10 mm. long, in lax terminal racemes ; bracts linear, shorter to almost as long as the pedicels ; pedicels 4–6 mm. long. Calyx 6–8 mm. long, appressedly pilose ; lobes lanceolate, much longer than the tube. Standard glabrous on the back. Keels rounded about the middle, ending in a short beak, broad, with the upper margin 2-lobed. Pods sub-globose or oblong, very oblique, 5–9 mm. long, 5–8 mm. broad, black with an appressedly white or yellow pubescence.

Natal.—Pietermaritzburg, *Sim* in Govt. Herb. 18228, *Mitchell in Govt. Herb.* 17518, *Sutherland* no number ; Inanda, *Wood* 385 ; Noodsberg, *Wood* 4134 ; near Pinetown, *Wood* 11506 ; Greytown, *Mogg* 13.

Portuguese East Africa.—Lourenco Marques, *Borle* 344 ; Delagoa Bay, *Schlechter* 11994.

52. **C. rotundicarinata** *Bak. f.* in Journ. Linn. Soc. Bot. 42 : 396.

Shrubs with softly pubescent branches, bearing numerous lateral branchlets. Leaves fairly dense, trifoliolate ; stipules linear, 3–7 mm. long ; petioles 2–10 mm. long, tomentellous ; leaflets oblanceolate or oblong, cuneate, 1–5 cm. long, 3–14 mm. broad, broadly rounded at the apex with a minute mucro, cuneate at the base into a small petiolule, glabrous on the upper surface, softly appressedly pubescent on the lower. Racemes short, usually 2-flowered, leaf-opposed and terminal on the lateral branchlets. Flowers 10–12 mm. long ; pedicels 6–12 mm. long ; bracts linear, acute, 3–5 mm. long ; bracteoles 2, about midway on the pedicel. Calyx 7–10 mm. long, appressedly pilose ; lobes narrowly deltoid, acute, longer than the tube. Standard hispid on the midrib and towards the apex. Keels U-shaped, broad, very shortly beaked, and 2-lobed on the upper margins, glabrous. Pods oblong, about 1·5–2 cm. long, densely villose.

Nyasaland.—*Buchanan* 821 ; Mt. Milanji, *Whyte* no number.

53. **C. Argyraea** *Welw.* ex Bak. in Oliv. Fl. Trop. Africa 2 : 26 (1871) ; Hiern Cat. Welw. African Pl. 1 : 200, non Franchet. *C. pechueliana* Schinz in Verh. Bot. Brand 30 : 157 (1886) ; Bak. f. 351.

An erect branching suffrutex, the whole silvery puberulous. Leaves trifoliolate ; stipules none ; petioles 1·5–3·5 cm. long ; leaflets elliptic to oblong-cuneate, 1·5–3·5 cm. long, rounded or acute at the apex, petioluled at the base, somewhat glaucous, appressedly silvery pubescent, the upper surface becoming glabrous. Racemes terminal and leaf-opposed, few to many flowered. Flowers 1–1·5 cm. long ; pedicels 3–6 mm. long ; bracts subulate, soon falling off ; bracteoles small, near the base of the calyx. Calyx about 5 mm. long, appressedly silvery pubescent ; tube wide, somewhat ridged at the base, becoming intruse at maturity ; lobes deltoid, about as long as the tube. Standard glabrous on the back. Keels boat-shaped, with a very short beak, glabrous on the surface. Pods oblique obovate, 11–15 mm. long, 7–9 mm. broad, with the style base lateral, silvery puberulous ; stipe 3–4 mm. long.

South-West Africa.—Okahandja, *Dinter* 300 ; Haikamchab, *Galpin* and *Pearson* 7608 ; Keetmanshoop to Windhoek, *Pearson* 9596, 9317 and 9774 ; Karakoes, *Schinz* 537 ; Aus, *Rogers* 29548.

54. **C. erecta** *Schinz* in Herb. Schinz. *C. mollis* var. *erecta* Schinz in Abhandl. Bot. Ver. Prov. Brand. 30 : 161 (1888) ; Bak. f. 359.

Shrubby, with stout, densely silvery silky-hirsute branches. Leaves trifoliolate ; stipules 2–6 mm. long, hirsute ; petioles 1–2 cm. long, rather stout, silky-hirsute ; leaflets obovate-cuneate, 2–3·5 cm. long, 1–2·5 cm. broad, broadly rounded at the apex, with a hairy apiculus, cuneate at the base, densely silky-hirsute on both surfaces. Racemes terminal, densely few to many flowered. Flowers 1·2–1·9 cm. long ; pedicels 6–10 mm. long, densely silky-hirsute ; bracts narrow-linear, 6–10 mm. long, acute, hirsute ; bracteoles 2 on the pedicels, somewhat smaller than the bracts. Calyx almost as long as the corolla, 1–1·5 cm. long, densely silky-hirsute ; lobes deltoid, acuminate, longer than the tube. Standard glabrous, except for a distinct line of hairs along the mid-rib. Keels rounded about the middle, ending in a distinct beak, glabrous. Pods broadly oblong, 2·5–3 cm. long, 1·2–1·5 cm. broad, tomentose-hirsute, the hairs rubbing off at maturity.

South-West Africa.—Grasplek, *Dinter* 3811 and 1033 ; Kolmanskuppe, *Dinter* 4062 ; Luderitzbucht, *Peyer* 12 ; Angra Pequena, *Schenk* 16.

55. **C. colorata** *Schinz* in Mém. Herb. Boiss. 1 : 127 (1900) ; Bak. f. 359.

Root-stock woody, yellow. Branches many from the root-stock, rather short, appressedly silky-pubescent. Leaves trifoliolate ; stipules 2–5 mm. long, pubescent ; petioles 1–2·5 cm. long, pubescent ; leaflets obovate-cuneate, 1–3 cm. long, 6–25 mm. broad, somewhat retuse at the apex, with a small mucro, cuneate at the base, appressedly silky-pubescent on both surfaces. Racemes terminal or leaf-opposed near the apices of the branches, rather lax, about 15-flowered. Flowers 1–1·5 cm. long ; pedicels 5–8 mm. long, pubescent ; bracts 2–6 mm. long, narrowly linear, acute, pubescent ; bracteoles 2 on the pedicels. Calyx almost as long as the corolla, 7–10 mm. long, densely and appressedly silky-pubescent ; lobes deltoid, acuminate, longer than the tube. Standard glabrous, except for a line of hairs along the mid-rib. Keels rounded about the middle, contracting into a distinct beak, glabrous. Pods broadly oblong, 2–2·5 cm. long, 1–1·5 cm. broad, appressedly silky-tomentose.

South-West Africa.—Swakop River Mouth, *Galpin* and *Pearson* 7606 ; Hereroland, *Dinter* 1, and 48.

56. **C. burkeana** *Benth.* in Hook. Lond. Journ. Bot. 2 : 593 (1843) ; Fl. Cap. 2 : 43 ; Bak. f. 322.

An erect herbaceous or suffruticose plant ; branches terete, whitish, patently pilose. Leaves 3–5-foliolate ; stipules setaceous, 1–1·5 cm. long, pilose ; petioles 1–3·5 cm. long, pilose with long patent hairs ; leaflets linear-lanceolate or narrowly oblong, 1–4·5 cm. long, 3–7 mm. broad, acute, petioluled, patently pilose on both surfaces, becoming glabrescent on the upper. Flowers up to 2 cm. long, in lax terminal and leaf-opposed racemes ; pedicels 2–5 mm. long, pilose, conspicuously bi-bracteolate at the apex ; bracts and bracteoles lanceolate, up to 6 mm. long, pilose. Calyx almost as long as the corolla, loosely pilose, deeply lobed ; lobes lanceolate. Standard pilose to glabrescent on the back. Keels bent in the lower half or somewhere about the middle and ending in a long beak, white woolly on the upper margins, otherwise glabrous. Pods oblong, 3–5 cm. long, about 1·5 cm. broad, pilose with bulbous-based hairs, turgid, cuneate at the base.

Bechuanaland.—Mafeking, *Burtt-Davy* 11077.

Transvaal.—Christiana, Bloemhof, *Burtt-Davy* 11383, 12994, 12881, 1494 ; Zeerust, *Rogers* 14094 ; Klerksdorp, *Badenhorst* no number ; Pretoria, Magaliesberg, *Burke* and *Zeyher* 1843, *Zeyher* 371 ; Aapies River, *Burke* 107 ; Waterberg, *Burtt-Davy* 19065 ; Barberton, *Rogers* 24286 and 18217, *Galpin* 1889 and 405, *Pott* 5351 ; Komatipoort Poort, *Rogers* 12855 ; Pietersburg, *Schlechter* 4356.

57. **C. incana** *Linn.* Sp. Pl. 716 (1753). *C. purpurascens Lam.* Encycl. 2 : 200 (1786). *C. Schimperi* A. Rich. Tent. Fl. Abyss. 1 : 151 (1847). *C. montana* A. Rich. Tent. Fl. Abyss. 1 : 152 (1847) ; Bak. f. 357.

Branches patently pilose. Leaves trifoliolate ; stipules setaceous, 4–15 mm. long, pilose, sometimes deciduous ; petioles 1–6 mm. long, pilose ; leaflets broadly obovate, 1–4 cm. long, 8–25 mm. broad, broad and mucronulate at the apex, cuneate at the base into a petiolule, glabrous on the upper surface, pilose on the lower. Racemes terminal and lateral, few to many flowered, lax. Flowers 7–14 mm. long ; pedicels up to 6 mm. long, pilose ; bracts setaceous, longer than the pedicels ; bracteoles at the base of the calyx, setaceous, deciduous. Calyx 8–12 mm. long, usually as long as the corolla, pilose ; lobes narrow-lanceolate, acuminate, several times longer than the tube. Standard pilose on the mid-rib, otherwise glabrous on the back. Keels broadly U-shaped or boat-shaped, shortly beaked, glabrous in lower half, white woolly near the upper margin and on the margin. Pods oblong cylindric, 3–5 cm. long, sub-sessile, pilose.

Rhodesia.—Bulawayo, *Eyles* 84 ; Salisbury, *unknown collector, in Herb. Dept. Agric.* Southern Rhodesia, 3318 ; Umtali, *Teague* 194.

58. **C. cleomifolia** *Welw.* ex Baker in Fl. Trop. Africa 2 : 43. Hiern Cat. Welw. Afr., Pl. 1 : 204 ; Bak. f. 350.

Branches robust, softly pubescent. Leaves 3–5-foliolate ; stipules reflexed, about 3 mm. long, deciduous ; petioles 1·5–4 cm. long, softly pubescent ; leaflets elliptic, 2·5–10 cm. long, 6–30 mm. broad, acute, cuneate at the base into a hairy petiolule, glabrous on the upper surface, pubescent on the lower with yellow hairs. Racemes terminal, many flowered. Flowers 1·5–1·8 cm. long ; pedicels 5–8 mm. long, densely pubescent ; bracts 4–6 mm. long, subulate with a broad base, pubescent on the back, reflexed ; bracteoles smaller, at the base of the calyx. Calyx about 7 mm. long, stiffly pubescent ; tube broad, with the base rigid, becoming intruse in mature flowers ; teeth deltoid, acuminate, about as long as the tube, with broad sinuses between. Standard glabrous on the back. Keels boat-shaped, with a short sharp beak, glabrous on the surface. Pods linear-oblong, 3–4·5 cm. long, tomentose, shortly stipitate.

Rhodesia.—Inyanga *Henkel* in Herb. Eyles 2611.

Portuguese East Africa.—Vila Pery, *Esselen* no number.

Nyasaland.—Shire Highlands, *Buchanan* 442.

59. **C. Chirindae** *Bak. f.* in Journ. Linn. Soc. Bot. 42 : 377.

Branches long, striate, thinly strigose in the older parts and tomentellous in the younger. Leaves trifoliolate ; stipules small, subulate, deciduous ; petioles 1–4 cm. long, strigose ; leaflets lanceolate to elliptic, variable, 2–14 cm. long, 4–35 mm. broad, acute, mucronate, shortly petioluled at the base, thinly strigose beneath, glabrous above. Racemes terminal, many flowered. Flowers about 1 cm. long ; pedicels 2–4 mm. long, tomentellous ; bracts linear-setaceous, 4–8 mm. long, strongly reflexed ; bracteoles linear, at the base of the calyx, as long or longer than the calyx. Calyx 4–6 mm. long, hirsute ; lobes deltoid, acuminate, about as long as the tube. Standard glabrous on the back. Keels boat-shaped or broadly U-shaped, ending in a short straight beak, glabrous on the surface. Pods strongly deflexed, linear-oblong, up to 2·5 cm. long, 5 mm. broad, hirsute, shortly stipitate.

Rhodesia.—Chrindae, *Swynnerton* 1498, 397.

Nyasaland.—Shire Highlands, *Buchanan* 452.

60. **C. Rogersii** *Bak. f.* in Journ. Linn. Soc. Bot. 42 : 347.

Stems many from a woody base, erect, puberulous. Leaves trifoliolate ; stipules subulate, soon falling off ; petioles 1–3·5 cm. long, puberulous, rather flattened ; leaflets oblong-elliptic or oblong-cuneate, 2·5–6 cm. long, 7–25 mm. broad, rounded or slightly retuse at the apex, sometimes minutely mucronate, cuneate at the base into an evident petiolule, glabrous on the upper surface, thinly strigose on the lower. Racemes terminal, few to many flowered. Flowers 1–1·6 cm. long, pedicels 2–5 mm. long, tomentellous ; bracts subulate, deciduous ; bracteoles very small, at the base of the calyx. Calyx 5–8 mm. long, pubescent ; lobes deltoid, acute, slightly longer than the tube ; tube in mature flowers somewhat rigid at the base. Standard glabrous on the back. Keels boat-shaped, ending in a pointed beak, drying wine-coloured, glabrous on the surface. Pods narrowly oblong, about 2·5 cm. long, 6 mm. broad, stipitate, shortly and softly pubescent.

Rhodesia.—Southern Rhodesia, *Walters* 2326 ; Salisbury, *Rogers* 4011 ; Mazabooka, *Rogers* 8330 and 26109 ; Chilanga, *Rogers* 8471 ; Mumbwa, *Macaulay* 816 ; Zambesi-land, Manganja Hills, *Meller* no number.

Nyasaland.—Zomba, *Sharpe* 36.

61. **C. tabularis** *Bak. f.* in Journ. Linn. Soc. Bot. 42 : 324.

A branching shrub ; the branches terete, puberulus. Leaves trifoliolate ; stipules none ; petioles 3–6 cm. long, puberulous ; leaflets oblong-obovate or cuneate-obovate, 3·5–7 cm. long, 1·5–3 cm. broad, rounded at the apex with a small mucro, cuneate at the base into a distinct petiolule, shortly and thinly pilose beneath. Racemes terminal and axillary, many flowered. Flowers about 2 cm. long ; pedicels 1–1·5 cm. long, bi-bracteolate about the middle. Calyx about 1 cm. long, 5-lobed ; lobes deltoid, about as long as the tube, shortly pubescent. Standard glabrous on the back. Keels rounded about the middle ending in a fairly long beak, glabrous with the lower margin shortly fringed. Pod not seen.

Nyasaland.—Nyika Plateau, *A. Whyte.*

62. **C. striata** *DC.* Prod. 2 : 131 (1825) ; Bot. Mag. t. 3200 ; Fl. Trop. Africa 2 : 38 ; Bak. f. 345. *C. pisiforme Guill.* and *Perr.* Fl. Seneg. Tent. 162 (1832). *C. pallida Klotzsch* in Peters' Mosamb. Bot. 57 (1862). *C. fertilis Delile* in Ferr. and Gall. Roy. Abyss. 122, t. 11.

Shrubs, with striate softly pubescent branches, the youngest parts grey sericeus. Leaves trifoliolate ; stipules none ; petioles 2·9 cm. long, softly pubescent ; leaflets broadly elliptic to oblong-cuneate, 3–5 cm. long, 1·5–5 cm. broad, rounded at the apex with a small mucro, cuneate at the base into an obvious petiolule, pubescent on the lower surface, glabrescent on the upper. Racemes many flowered, leaf-opposed. Flowers 1–1·5 cm. long ;

pedicels 3–6 mm. long, pubescent ; bracts linear, deciduous ; bracteoles small, at the base of the calyx. Calyx 5–9 mm. long, pubescent ; lobes deltoid, acuminate, about as long as the tube. Standard glabrous on the back. Keel boat-shaped, with a sharp beak, glabrous on the surface. Pods cylindric, about 3·5 cm. long, 6–12 mm. broad, shortly stipitate, appressedly pubescent.

Orange Free State.—Vierfontein, *Blackbeard in Govt. Herb. Pretoria* 9168.

Transvaal.—Barberton, *Rogers* 20277 and 14221, *Moore* and *King in Govt. Herb. Pretoria* 14142 and 13970.

Natal.—*Gerrard* 1772 ; Inanda, *Wood* 913 ; Durban, *Cooper* 1264, *Sanderson* 908, *Wood* 11671 ; Umgeni, *Wood* 10204.

Portuguese East Africa.—Lourenco Marques, *Wilms* 255, *Borle* 366.

Zambesi-land.—*Kirk*.

Rhodesia.—Umtali, *Teague* 57.

Nyasaland.—East Coast of Lake Nyasa, *Johnson* 31 ; Shiri, *Steward* no number.

63. **C. Nicholsonii** *Bak. f.* in Journ. Linn. Soc. Bot. 42 : 346.

An erect plant with fistular longitudinally striate strigose branches. Leaves trifoliolate : stipules none ; petioles 1·5–2·5 cm. long, strigose ; leaflets elliptic or ovate, 2·5–5 cm. long, 1–2 cm. broad, mucronulate, cuneate at the base into an obvious petiolule, glabrous on the upper surface, thinly strigose on the under. Racemes long, many flowered in the upper half, leaf-opposed. Flowers 9–12 mm. long ; pedicels 3–6 mm. long, pubescent ; bracts deciduous, subulate, about 2 mm. long ; bracteoles minute, at base of calyx. Calyx intruse at the base in the mature flowers, about 5 mm. long, pubescent ; lobes deltoid, acuminate, about as long as the tube. Standard glabrous on the back. Keels boat-shaped, ending in a sharp beak, glabrous on the surface and striate with dark purple markings. Pod not seen.

Nyasaland.—Kondowe, *Whyte* no number ; Loangwene, *Nicholson* no number.

64. **C. flavicarinata** *Bak. f.* 333. *C. cataractarum Bak. f.* in Journ. Bot. 58 : 75 (1920).

An erect shrub ; branches virgate, longitudinally grooved, some distinctly 4-sided, thinly pubescent or strigose, becoming glabrescent. Leaves trifoliolate ; stipules linear, up to 4 mm. long, deciduous ; petioles 5–25 mm. long, striate and grooved, strigose ; leaflets lanceolate-oblong to broadly oblong, 1·5–4·5 cm. long, 4–18 mm. broad, minutely mucronate at the apex, distinctly petioluled at the base, glabrous on the upper surface, thinly strigose on the lower. Racemes terminal, sometimes on short axillary branchlets. Flowers about 1–1·5 cm. long ; pedicels 4–6 mm. long, pubescent ; bracts 2 mm. long, subulate ; bracteoles 2 on the pedicels, smaller than the bracts. Calyx 5–7 mm. long, pubescent ; tube broadly cylindric ; lobes deltoid, acute, shorter than the tube. Standard pubescent, becoming glabrous on the back. Keels bent sharply in the lower half and ending in a long beak, glabrous on the surface. Pod cylindric, about 2 cm. long, 5–6 mm. broad, pubescent, erect.

Rhodesia.—Victoria Falls, *Allen* 31, *Rogers* 13042, 13290 and 5123 ; Barotse, *Borle* 272.

65. **C. Buchananii** *Bak. f.* in Legumi nosæ of Tropical Africa 1 : 33.

An annual, branching in the lower half ; branches pilose. Leaves trifoliolate, more or less obscuring the flowers ; stipules small, subulate, pilose ; petiole flattened, 4–6 mm. long, stiffly pilose ; leaflets linear-oblanceolate, 7–14 mm. long, 1–2·5 mm. broad, acute, cuneate at the base, pilose. Racemes terminal, somewhat hidden in the upper leaves and axillary on the branches. Flowers up to 6 mm. long ; pedicels 1–2 mm. long, pilose, rather

stout. Calyx about 4 mm. long, pilose ; lobes lanceolate, acute, much longer than the tube. Standard densely pilose. Keels bent at right angles near the base and ending in a straight beak. Ovary about 4-ovuled. Pod globose, about 4 mm. in diameter, pilose.

NYASALAND.—Shire Highlands, Blantyre, *Buchanan* 62.

RHODESIA.—Umtali, *Teague* 455.

66. **C. sparsifolia** *Bak.* in Kew Bull. 249 (1897) ; Bak. f. 304.

An erect herb, much branched from the base ; branches virgate, very slender, appressedly pubescent, very sparingly leafy in the lower half. Leaves trifoliolate, soon falling off ; stipules none or deciduous ; petioles 2–5 mm. long ; leaflets linear-oblanceolate, 4–10 mm. long, appressedly pilose beneath. Flowers about 4–6 mm. long, in long very lax terminal racemes ; bracts small, subulate, erect ; pedicels up to 2 mm. long, erect, appressedly pubescent. Calyx about 3–4 mm. long ; lobes acute, longer than the tube, appressedly pilose. Standard densely appressedly pilose on the back. Keel bent at right angles near the base, and ending in a straight narrow beak, glabrous. Pod sub-globose, about 4 mm. long, erect, pilose.

NYASALAND.—Nyika plateau, between Kondowe and Karonga, *Whyte* no number.

67. **C. filicaulis** *Welw.* ex Baker in Fl. Trop. Africa 2 : 24 (1871) ; Hiern Cat. Welw. Afr. Pl. 1 : 199 ; Bak. f. 291.

An erect slender appressedly pubescent virgate annual ; stem simple or somewhat branched at apex. Leaves trifoliolate ; stipules linear, deciduous ; petioles 2–5 mm. long ; leaflets linear, 10–18 mm. long, 1–2 mm. broad, thinly strigose, mucronate, cuneate at the base. Racemes terminal, lax, with the flowers more or less at intervals along the peduncles and sometimes solitary in the axils of the upper leaves. Flowers 4–5 mm. long ; bracts erect, shorter than the pedicels ; pedicels erect, about 2 mm. long, strigose, usually bi-bracteolate in the upper half. Calyx about 3 mm. long, appressedly silky tomentose ; lobes deltoid, as long or longer than the tube. Standard appressedly silky tomentose on the back. Keel bent at right angles in the lower half and broadly ascending into a straight beak, glabrous. Pod globose, 3–5 mm. long, sessile, erect, appressedly pubescent.

RHODESIA.—Umtali, *Teague* 439.

NYASALAND.—Fort Hill, *White* no number.

68. **C. argyrolobioides** *Bak.* in Kew Bull. (1897) 249 ; Bak. f. 384.

A much branched slender herb ; branches sericeus strigose. Leaves trifoliolate ; stipules none or minute ; petioles slender, 2–10 mm. long ; leaflets oblanceolate to obovate, 7–20 mm. long, 3–7 mm. broad, rounded at the apex, minutely mucronate, cuneate at the base into a small petiolule, glabrous on the upper surface, appressedly pubescent on the lower. Racemes on terminal and lateral branchlets, with the upper flowers sub-umbellate. Flowers 7–10 mm. long ; pedicels 4–8 mm. long, appressedly pubescent ; bracts small, subulate ; bracteoles in the lower half of the pedicel. Calyx 4 mm. long, pubescent ; lobes deltoid, about as long as the tube. Standard pubescent at the apex on the back. Keels bent sharply in the lower half and ending in a long straight beak, glabrous on the surface. Pods oblong-globose, 6–8 mm. long, 4–5 mm. broad, pubescent, sub-sessile.

NYASALAND.—Nyika Plateau, *Whyte* 109 and 117.

69. **C. microcarpa** *Hochst.* ex Benth. in Hook. Lond. Journ. Bot. 2 : 573 (1843) ; Bak. f. 402.

A dichotomously branched herb ; branches slender, terete, pilose. Leaves trifoliolate ; stipules setaceous, 1–2 mm. long, deciduous ; petioles 1·5–3 mm. long ; leaflets narrowly oblong-cuneate or somewhat obovate, 7–18 mm. long, 2–5 mm. broad, rounded or truncate and mucronate at the apex, cuneate at the base, pilose on the lower surface, thinly pilose or

glabrous on the upper. Racemes numerous, as long as or slightly exceeding the leaves, the flowers usually aggregated at the apex into a small head. Flowers 5–7 mm. long ; pedicels 1–2 mm. long ; bracts linear, acute, longer than the pedicels ; bracteoles 2, at the base of the calyx, linear, setose, exceeding the calyx tube. Calyx 2–3 mm. long, pilose ; lobes deltoid, acute, about as long as the tube. Standard pilose on the back. Keels bent sharply in the lower half and ending in a long straight beak, glabrous on the surface. Pods oblong, 5–7 mm. long, 2–3 mm. broad, sessile, thinly pilose.

Rhodesia.—*Rogers* 8246.

South-West Africa (probably Bechuanaland).—*Chapman* and *Baines* no number.

70. **C. nyikensis** *Bak.* in Kew Bull. (1897) 250 ; Bak. f. 280.

Branches virgate, appressedly villose. Leaflets trifoliolate ; stipules none ; petioles 2–10 mm. long, villose ; leaflets oblanceolate, about 5–17 mm. long and 1·5–4 mm. broad, mucronate, villose beneath, more or less glabrous above. Racemes terminal, oblong-globose, with the flowers crowded. Flowers 5–10 mm. long ; pedicels 2–8 mm. long, pilose ; bracts about as long as the pedicels, pilose. Calyx densely villose, about half as long as the corolla ; lobes deltoid, about as long as the tube. Standard villose all over the back. Keel bent almost at right angles below the middle and ending in a long slender straight beak, glabrous, with the upper margins not bearded or ciliate. Pods globose-oblong, about 4 mm. long and 3 mm. broad, densely villose.

Nyasaland.—Nyika Plateau, *Whyte* 197.

71. **C. phyllostachys** *Bak.* in Kew Bull. 1897, 250 ; Bak. f. 301.

Shrub erect, branching at the apex, pilose. Leaves trifoliolate ; stipules deciduous ; petioles about 7 mm. long, flattened, pilose ; leaflets oblanceolate or linear-oblong, 12–20 mm. long, 1·5–3 mm. broad, mucronate, cuneate at the base, thinly pilose. Flowers on the same plant in terminal racemes and also 1–3-nate in the leaf-axils along the stem, about 7–12 mm. long ; bracts erect, subulate ; pedicels about 4 mm. long, pilose. Calyx about 4 mm. long, pilose ; lobes lanceolate, acute, longer than the tube. Standard sparingly pilose at the apex on the back. Keel bent at right angles near the base and ending in a long slender beak, slightly hooked at the apex, glabrous. Pod sub-globose, sessile, about 4 mm. long, pilose.

Nyasaland.—Nyika Plateau, *Whyte*.

72. **C. Mumbwae** *Bak. f.* 300.

Erect annual ; stem unbranched, striate, appressedly pubescent. Leaves trifoliolate ; stipules small, deciduous ; petiole flattened and narrowly winged, 7–11 mm. long ; leaflets cuneate-oblanceolate, 15–22 mm. long, thinly appresedly hairy, broad and mucronate at the apex, cuneate at the base. Flowers about 9 mm. long, or longer, in terminal racemes and clustered in the leaf axils. Pedicels erect, about 7 mm. long, longer than the bracts. Calyx about 4 mm. long, strigose ; lobes lanceolate, longer than the tube. Standard not seen. Keel bent at right angles near the base and ending in a long narrow straight sharp beak, glabrous. Pod globose, about 4 mm. long, erect, appressedly pubescent.

Rhodesia.—Mumbwa, *Macaulay* 399.

73. **C. erythrophleba** *Welw.* ex Bak. in Fl. Trop. Africa 2 : 25 (1871) ; Hiern Cat. Welw. Afr. Pl. 1 : 200 (1896) ; Bak. f. 286.

Herb with virgate branches, strigose. The leaves trifoliolate, with the upper reduced to a single leaflet ; stipules none ; petioles flattened, 3–6 mm. long ; leaflets small, narrowly linear-oblanceolate, 6–8 mm. long, 1–2 mm. broad, silvery strigose beneath, cuneate at the base into a very small yellowish petiolule. Flowers in terminal racemes and in the axils of the upper leaves, about 8–9 mm. long ; pedicels erect, about 3 mm. long, strigose, sometimes 2-, or more-nate ; bracts small, subulate, shorter than the pedicels. Calyx about

3 mm. long, strigose; lobes deltoid-lanceolate, a little longer than the tube. Standard thinly silvery strigose on the back near the apex. Keel bent at right angles in the lower half and ending in a long straight beak, glabrous. Pod globose, about 3 mm. in diameter, thinly silvery strigose, on an erect pedicel.

Rhodesia.—Mumbwa, *Macaulay* 736.

74. **C. hyssopifolia** *Klotsch* in Peters' Mossamb. Bot. 1 : 55 (1862); Fl. Trop. Africa 2 : 24 non Schinz in Pl. Menyh. *C. gracillima Klotzsch* l.c.; Bak. f. 286.

An erect herb, usually branching from the base; branches appressedly pubescent. Leaves trifoliolate; stipules none; petioles 3–8 mm. long, flattened, appressedly pubescent; leaflets cuneate-spathulate to oblong-oblanceolate, 7–15 mm. long, 2–5 mm. broad, mucronate, cuneate at the base, appressedly pubescent beneath, very thinly pubescent above or glabrous. Racemes terminal, with numerous flowers and occasionally a solitary flower in the axils of the leaves. Flowers 3–5 mm. long; bracts linear, erect, shorter than the pedicels; pedicels erect, slender, more than half the length of the flower, appressedly pubescent, sometimes bracteolate. Calyx strigose, about half as long as the corolla; lobes deltoid to lanceolate, as long or longer than the tube. Standard pilose on the back. Keel bent at right angles below the middle and ending in a long straight beak, glabrous. Pod globose or sub-globose, 3–4 mm. in diameter or up to 5 mm. long and 4 mm. wide, pilose.

Nyasaland.—Blantyre, *Buchanan* no number; Shire Highlands, *Adamson* 328; Nandi, *Whyte* no number; Fort Hill, *Whyte* no number.

75. **C. Johnstonii** *Bak.* in Kew Bull. (1897), 250; Bak. f. 285. *C. leucotricha Bak.* in Kew Bull. (1897), 251; Bak. f. 235.

An erect slender herb, branching from the base; branches appressedly pilose. Leaves trifoliolate; stipules none or early deciduous; petioles 2–8 mm. long, strigose, flattened; leaflets oblong-oblanceolate or oblanceolate, 5–30 mm. long, 2–8 mm. broad, mucronate, cuneate at the base, pilose to thinly pilose on both surfaces. Racemes terminal, with flowers numerous and flowers solitary in the leaf-axils of the same plant. Flowers about 6 mm. long; bracts linear, erect, usually longer than the pedicel; pedicels about 2 mm. long, pilose, usually erect, less than half as long as the corolla. Calyx more than half as long as the corolla, pilose; lobes lanceolate, acuminate, longer than the tube. Standard pilose on the back. Keel bent at right angles below the middle and ending in a long straight beak, glabrous. Pod sub-globose, about 3 mm. in diameter, thinly pilose.

Nyasaland.—Fort Hill, *Whyte* no number, *Whyte* no number.

76. **C. geminiflora** *Dinter* ex Bak. f. 391. *C. homalocarpa* Bak. f. in Journ. Bot. 58 : 75 (1920).

Procumbent plant, with long straggling branches, patently hispid. Leaves trifoliolate; stipules linear, acuminate, 6–8 mm. long, hispid; petioles 1·5–4 cm. long, hispid; leaflets ovate to ovate-lanceolate, 1·5–3·5 cm. long, 4–15 mm. broad, bluntly acuminate, mucronate, shortly petioluled at the base, glabrous on the upper surface, thinly hispid on lower surface and margins. Racemes leaf-opposed, with about 1–5 flowers aggregated at the apex of the peduncle. Flowers about 12 mm. long; pedicels about 2 mm. long; bracts linear-lanceolate, about 3–4 mm. long, hispid; bracteoles 2, near the base of the calyx, larger than the bracts, ovate-lanceolate, 4–6 mm. long, hispid on the margins. Calyx about 1 cm. long, almost as long as the corolla; tube short, glabrous; lobes ovate-lanceolate, much longer than the tube, hispid on the margins. Standard glabrous or with a few hispid hairs on the midrib. Keels bent almost at right angles in the lower half and ending in a long straight blunt beak. Pods oviform, 1·5–2 cm. long, about 1 cm. broad, shortly but distinctly stipitate, thinly patently hispid at least along lower suture, sometimes quite glabrous.

Transvaal.—Pietersburg, Marabastad, *Schlechter* 4338.

British Bechuanaland.—Vryburg, *Mogg* 8513.

Hereroland.—Okavango, *Dinter* 473.

Rhodesia.—Kafue Station, *Rogers* 8721 ; Wankie, *Rogers* 13302.

77. **C. pisicarpa** *Welw.* ex Baker in Fl. Trop. Africa 2 : 16 (1871) ; Hiern Cat. Welw. Afr. Pl. 1 : 197 ; Bak. f. 303.

Herb, much branched from the base ; branches long, trailing, patently pilose. Leaves trifoliolate ; stipules small, acute ; petioles 6–18 mm. long, pilose ; leaflets sub-orbicular or broadly obovate, 11–25 mm. long, 6–15 mm. broad, retuse or sometimes with a small mucro at the apex, cuneated at the base into a very short petiolule, gland-marked on the upper surface, pilose on the lower. Racemes leaf-opposed all along the branches, not clearly longer than the subtending leaf. Flowers 2–6, collected at the apex of the peduncle, about 5 mm. long. Calyx 3·5–4·5 mm. long ; lobes acute, longer than the tube, pilose. Standard glabrous on the back. Keels bent at right angles near the base and ending in a straight beak, glabrous. Pod globose, like a pea, about 6 mm. in diameter, sessile, white tomentose.

South-West Africa.—Okahanja, *Dinter* 567.

Rhodesia.—*Rogers* 13254 and 8722 ; Livingstone, *Rogers* 7016 ; Victoria Falls, *Kolbe* 3173.

78. **C. pilulicarpa** *Taub.* **var Schinzii** *Bak. f.* 303.

Annual, branching from the base ; branches long, trailing, patently pilose. Leaves trifoliolate ; stipules small, subulate ; petioles 6–20 mm. long, pilose ; leaflets oblong-cuneate or elliptic, difform, broad and narrow on the same plant, 20–50 mm. long, 5–14 mm. broad, rounded and mucronate or narrow and acute at the apex, cuneate at the base into a very short petiolule, obscurely gland-pitted on the upper surface, pilose on the lower. Racemes leaf-opposed all along the branches, not clearly longer than the subtending leaf. Flowers 2–4, sub-umbellate at the apices of the peduncles, about 6 mm. long. Calyx about 3–4 mm. long ; lobes acute, longer than the tube, pilose. Standard glabrous on the back. Keels bent at right angles near the base and ending in a straight beak, glabrous. Pods globose, pea-shaped, about 6 mm. in diameter, white tomentose.

Transvaal.—Vaalboschfontein, *Schlechter* 4234 ; Elands River, *Rehmann* 4911 ; Pietersberg, *Bolus* 10915.

Bechuanaland.—Mochudi, *Rogers* 6904.

South-West Africa.—Otavi, *Dinter* 5680.

79. **C. reptans** *Taub.* in Engl. Pflanzenwelt Oost. Africa C. 204 (1895) ; Bak. f. 304.

Stems long, trailing, patently pilose ; internodes from 4–9 cm. long. Leaves trifoliolate ; stipules small, acute ; petioles 20–28 mm. long, pilose ; leaflets oblong, cuneate or obovate, 1·7–4 cm. long, 7–20 mm. broad, rounded and mucronate at the apex, broadly cuneate at base into a very short petiolule ; obscurely gland-pitted on the upper surface, pilose on the lower. Racemes opposite the leaves and clearly longer than the subtending leaf. Flowers 2–4, aggregated at the apex of the long pilose peduncle, about 6–7 mm. long. Calyx 4–5 mm. long ; lobes acute, longer than the tube, pilose. Standard glabrous on the back. Keels bent at right angles in the lower half and ending in a rather broad erect beak. Pods globose, pea-shaped, about 6–8 mm. in diameter, white tomentose.

Nyasaland.—*Buchanan* 1193 and 896 ; Zomba, *Sharpe* 121 ; Likoma, *Johnson* 51.

Rhodesia.—*Flanagan* 3091.

80. **C. Dinteri** *Schinz* in Bull. Herb. Boiss. ser. 2, 1 : 875 (1901) ; Bak. f. 302.

Branches long and trailing, softly and shortly white pubescent. Leaves trifoliolate ; stipules acute, 2 mm. long ; petioles 3–10 mm. long, pubescent ; leaflets obovate, 7–15 mm. long, 5–10 mm. broad, broadly rounded or retuse at the apex, strongly cuneate at the base,

shortly pubescent on the lower surface. Racemes leaf-opposed, much exceeding the subtending leaf. Flowers 8–10 mm. long ; pedicels 2–5 mm. long ; bracts subulate, up to 3 mm. long ; bracteoles 2, at the base of the calyx, small, subulate. Calyx 4–6 mm. long, shortly pubescent ; lobes broadly lanceolate, abruptly ending in a rather oblique acute apex, longer than the tube. Standard shortly pubescent on the back. Keels bent in the lower half and ending in a long straight beak, glabrous on the surface. Pods sub-globose, 7–8 mm. long, 5–6 mm. broad, shortly stipitate, shortly white pubescent.

South Africa.—No locality, *Burchell* 2519 and 2583 ; *Silk* 235.

South-West Africa.—Lichtenstein, *Dinter* 4335 ; Windhoek, *Dinter* 317.

81. **C. Friesii** *Verdoorn* n. sp.

A prostrate plant with long terete stems, sparingly branched ; pubescence appressedly sericeus, but in parts, and especially the young parts, sometimes white tomentose. Leaves trifoliolate ; stipules 1–2 mm. long, subulate, deciduous ; petioles 3–11 mm. long, silky strigose ; leaflets oblanceolate or oblong, 5–22 mm. long, 2–6 mm. broad, rounded, sometimes with a small mucro at the apex, cuneate at the base, impressedly dotted on the upper surface, appressedly sericeus on the lower. Racemes terminal and lateral, laxly 5–12-flowered. Flowers 1–1·5 cm. long ; bracts 1–2 mm. long, broad based, acute ; bracteoles 2, at the apex of the pedicel ; pedicels 2–4 mm. long, appressedly silky or tomentose. Calyx 4–7 mm. long, silky or tomentose ; lobes deltoid, slightly longer than the tube. Standard silky all over the back. Pods obovoid-oblong, sub-sessile, silky-pubescent.

Rhodesia.—Near Broken Hill, *Fries* 219 (type) ; Lusaka, *Rogers* 8906 ; Mazabuka, *Rogers* 26126.

C. Friesii *Verdoorn* sp. nov.

Caules longi, teretes, prostrati, pauce ramosi, appresse sericei vel hac atque illac albotomentosi. Folia trifoliolata, petiolata, foliolis oblanceolatis vel oblongis, 5–22 mm. longis, 2–6 mm. latis, infra appresse sericeis. Flores 1–1·5 cm. longi, in racemos terminales vel laterales, 5–12-flores dispositi. Pedicelli 2–4 mm. longi. Calyx 4–7 mm. longus, sericeus vel tomentosus, lobis triangularibus. Vexillum extus sericeum. Legumen obovoideo-oblongum, sub-sessile, sericeo-pubescens.

82. **C. shamvaensis** *Verdoorn* n. sp.

Stems prostrate, sparingly branched ; branches terete, long, decumbent, softly and conspicuously white pubescent. Leaves trifoliolate ; stipules linear-subulate, 2–3 mm. long ; petioles 6–20 mm. long, somewhat flattened ; leaflets lanceolate-oblong to narrowly oblong, 1–3 cm. long, 2–5 mm. broad, acute or rounded and mucronate at the apex, shortly cuneate at the base, pubescent on both surfaces. Racemes terminal on the branches, long, many flowered. Flowers yellow, 8–12 mm. long ; bracts subulate, 3–4 mm. long, pubescent ; bracteoles 2, near the apex of the pedicel, subulate, about 2 mm. long ; pedicels about 2–4 mm. long, pubescent. Calyx 5–7 mm. long, pubescent ; lobes deltoid-acuminate, longer than the tube. Standard pubescent on the back. Young pod white silky tomentose, stipitate, about 8 mm. long. Mature pod not seen.

Rhodesia.—Shamva, *Mainwaring in Herb. Eyles* 2244 (type). (Probably also *Teague* 178, from Umtali.)

C. shamvaensis *Verdoorn* sp. nov.

Caules prostrati, pauce ramosi. Rami teretes, longi, decumbentes, molliter albopubescentes. Folia trifoliolata, petiolata foliolis lanceolato-oblongis vel lineari-oblongis, 1–3 cm. longis, 2–5 mm. latis, pubescentibus. Stipulae lineari-subulatae. Flores 8–12 mm. longi, in racemos terminales pluriflores dispositi, flavi. Bracteae subulatae, 3–4 mm. longae, pubescentes. Calyx 5–7 mm. longus, pubescens, lobis triangulari-acuminatis quam tubo longioribus. Vexillum extus pubescens. Legumen immaturum sericeo-tomentosum, stipitatum, circiter 8 mm. longum.

83. **C. macrocarpa** *E. Mey.* Comm. 24 (1835); Fl. Cap. 2 : 45; Bak. f. 324.

A branching shrub; branchlets somewhat angled, shortly silky. Leaves trifoliolate; stipules subulate, sometimes absent; petiole slender, 1–2 cm. long; leaflets obovate, 1–3 cm. long, 6–15 mm. broad, mucronulate at the apex, distinctly petioluled at the base, glabrous on the upper surface, shortly and thinly pubescent on the lower. Racemes terminal and leaf-opposed, many-flowered. Flowers about 1·5 cm. long; pedicels slender, about 1 cm. long, bi-bracteolate near the base, glabrescent above the bracteoles. Calyx about 1 cm. long, shortly and thinly pubescent, 5-lobed; lobes deltoid, acuminate, rather longer than the tube. Standard glabrous on the back, with a few short hairs on the midrib. Keels bent almost at right angles in the lower half and ending in a long beak, glabrous. Pod oblong in outline, about 3 cm. long and 1·7 cm. broad, hairy, becoming glabrescent, long stipitate; stipe about 1 cm. long.

Natal.—*Sanderson* 542, *Gerrard* 1723, *Sutherland* no number; between Omkomas and Omlas Rivers, *Drège* no number; Alexandra Dist., *Rudatis* 256.

84. **C. Stewartii** *Bak.* in Fl. Trop. Africa 2 : 32 (1871). *C. polysperma*, *Klotschy* subsp. *Stewartii Baker*; Bak. f. 321.

An erect herb about 2 ft. high, sparsely branched; branches pilose. Leaves trifoliolate; stipules setaceous, 10–15 mm. long, pilose; petioles 2–5 cm. long, pilose; leaflets ovate-lanceolate, 3–8 cm. long, 1–2·5 cm. broad, acute and mostly long mucronate at the apex, shortly petioluled at the base, pilose on both surfaces. Racemes leaf-opposed and very much exceeding the subtending leaf, lax. Flowers about 2 cm. long; pedicels 3–6 mm. long, pilose, bi-bracteolate at the apex; bracts setaceous; bracteoles lanceolate-linear, conspicuous, about 6 mm. long. Calyx about 1·5 cm. long, deeply lobed, densely pilose; lobes about twice as long as the tube, lanceolate. Standard pilose on the back. Keel bent at right-angles in the lower half and ending in a straight beak, thinly pilose on the upper part, otherwise glabrous, with the upper margin densely ciliate with long white hairs. Pod oblong in outline, up to 5 cm. long, 2·4 cm. broad, turgid, pilose.

Southern Rhodesia.—*Salisbury, in Herb. Dept. of Agric.*, Southern Rhodesia (*unknown collector*) 3319.

Portuguese East Africa.—Zambesiland, *Stewart* no number; Delta of Zambezi, *Scott* no number.

Transvaal.—Barberton, *Rogers* 18217.

85. **C. platycepala** *Harvey* Thes. Cap. 1 : 19 (1859) t. 29; Fl. Trop. Africa 2 : 34. *C. apiculata Schinz* in Mem. Herb. Boiss. 1 : 126 (1900). *C. Ulbrichiana*, *Harms* in Engl. Jahrb. 54 : 384 (1917).

An erect annual; branches pubescent. Leaves trifoliolate; stipules setaceous, about 3 mm. long; petioles 1·5–4·5 cm. long, slightly grooved above, pubescent; leaflets elliptic to oblong-ovate, 2–7 cm. long, 5–30 mm. broad, rounded at the apex with a minute mucro, cuneate at the base into a small petiolule. Racemes few, leaf-opposed and terminal, long, laxly flowered. Flowers 10–12 mm. long; pedicels about 4 mm. long; bracts linear, shorter than the pedicels, reflexed; bracteoles minute, at base of calyx. Calyx 4–6 mm. long, pubescent; lobes longer than the tube, becoming broader towards the apex, then suddenly constricted into an apiculus. Standard pubescent on the back. Keels bent almost at right-angles in the lower half and ending in a long beak, glabrous on the surface. Pods small, oviform, about 1 cm. long, sub-sessile, pubescent.

Bechuanaland.—Lake Ngami, *McCabe* 8; Kwebe, *Lugard* 158 and 178; Okavango Valley, *Lugard* 238.

Rhodesia.—Victoria Falls, *Rogers* 13307; Wankie, *Rogers* 13303.

South-West Africa.—Otavi, *Dinter* 5716.

86. **C. Junodiana** *Schinz* in Herb. Schinz, Bak. f. 341.

A branched suffrutex ; branches terete, appressedly pubescent. Leaves trifoliolate ; stipules subulate, about 2 mm. long ; petioles 7–15 mm. long, slightly grooved, pubescent ; leaflets oblong-cuneate, 1–3 cm. long, 6–10 mm. broad, rounded and obscurely mucronate or retuse at the apex, cuneate at the base, appressedly pubescent beneath. Racemes leaf-opposed, few flowered. Flowers about 7 mm. long ; bracts about 2 mm. long ; bracteoles at base of the calyx obscure ; pedicels about 2 mm. long, pubescent. Calyx 4–5 mm. long, pubescent ; lobes broadly lanceolate, abruptly acuminate into a rather oblique acute apex, longer than the tube. Standard pubescent on the back. Keels bent at right angles near the base, and ending in a long straight beak, glabrous on the surface, white pubescent on the inner margin. Pods oviform-oblong, 1·7–2 cm. long, pubescent, sessile.

Portuguese East Africa.—Delagoa Bay, *Junod* 388.

87. **C. maxillaris** *Klotzsch* in Peters' Mossamb. Bot. 58 (1862) ; Fl. Trop. Africa 2 : 30 ; Bak. f. 336. *C. karongensis Bak.* in Kew Bull. 252 (1897).

An erect suffrutex, with a few long branches ; branches ascending, striate, pubescent· Leaves trifoliolate ; stipules subulate, 2–4 mm. long ; petioles 1–5 cm. long, flattened, grooved, pubescent, persistent ; leaflets oblong, 1·5–6 cm. long, rounded at the apex, sometimes mucronate, shortly cuneate at the base into a petiolule, appressedly pubescent beneath. Racemes elongated, laxly many-flowered, terminal and leaf-opposed. Flowers 1–1·5 cm. long ; bracts 1 mm. long, or subulate and up to 3 mm. long ; bracteoles at the base of the calyx inconspicuous ; pedicels 3–5 mm. long, somewhat cernuous, pubescent. Calyx 5–6 mm. long, pubescent ; lobes broadly-lanceolate, abruptly ending in a rather oblique acute apex, much longer than the tube. Standard pubescent on the back. Keels bent at right angles near the base and ending in a long straight beak, glabrous on the surface, densely white ciliate on the upper margins. Pod oblong-obovoid, 1–1·5 cm. long, pubescent, sub-sessile.

Rhodesia.—Boruma, *Menyhart* 1011, Herb. Zurich.

Nyasaland.—Between Kondowe and Karonga, *Whyte* no number.

Portuguese East Africa.—Cabaceira, *Peters* no number.

88. **C. deserticola** *Taub.* in Herb. Schwein. Bak. f. 383.

Erect much branched plant ; branches striate, thinly strigose. Leaves trifoliolate, leaflets oblong (leaf material very poor). Racemes elongated, fairly laxly many flowered. Flowers about 8–10 mm. long ; bracts subulate, about 2 mm. long bracteoles 2, on the lower half of the pedicels, subulate, 1 mm. long. Calyx about 5 mm. long, glabrous ; lobes deltoid, acuminate, longer than the tube. Standard glabrous on the back. Keels bent abruptly in the lower half and ending in a straight beak, glabrous. Pods oblong in outline, about 2–2·5 cm. long, cuneate at the base into a short stipe, pubescent.

Nyasaland.—South-west Nyasa, Kageli, *Stubliann* 3483.

89. **C. Mundyi** *Bak. f.* in Leg. of Trop. Africa, 1 : 42. Partly (excl. Eyles 694).

Branches erect, herbaceous, longitudinally grooved, strigose. Leaves trifoliolate ; stipules setaceous, about 4 mm. long ; petioles 1–1·5 cm. long, flattened, somewhat patent, strigose ; leaflets linear, 2–5 cm. long, 2–8 mm. broad, mucronulate at the apex, shortly petioluled at the base, glabrous on the upper surface, strigose on the lower. Racemes terminal and leaf-opposed, lax, several flowered, much exceeding the leaves. Flowers 1·5–1·8 cm. long ; pedicels 3–5 mm. long, basal bract setaceous, about 3 mm. long ; bracteoles small, at the base of the calyx. Calyx about 5 mm. long, appressedly pubescent, somewhat 2-lipped ; lobes narrowly deltoid, acuminate, with the 3 lower at least about as long as the tube and upper sometimes longer. Standard long, enveloping the rest of the corolla,

appressedly pubescent on the back. Keels bent sharply in the lower half and ending in a long beak, glabrous, ciliate on the margin. Pods narrowly oblong in outline, 2 cm. long, 8 mm. broad, obviously stipitate, strigose.

Rhodesia.—Salisbury Experimental Station, *Mundy* 51 and 2809.

90. **C. natalensis** *Bak. f.* 357.

An erect branching shrub ; branchlets slender, angled, somewhat sericeus, becoming glabrous. Leaves trifoliolate ; stipules subulate, sometimes absent ; petioles slender, 1–4 cm. long ; leaflets obovate or oblong-elliptic, 1–3 cm. long, 6–16 mm. broad, minutely mucronate, distinctly petioluled at the base, glabrous on the upper surface, thinly and shortly hairy on the lower. Racemes leaf-opposed, not much exceeding the leaves, with about 6 flowers towards the apex. Flowers about 1 cm. long ; pedicels 5–7 mm. long, minutely bi-bracteolate near the base and less hairy above the bracteoles. Calyx thinly and shortly hairy ; lobes deltoid, acuminate, longer than the tube. Standard glabrous on the back. Keels bent at right-angles in the lower half and ending in a long beak, glabrous. Pods oblong-clavate, about 2 cm. long and 1·3 cm. broad, pubescent, becoming glabrescent, long-stipitate ; stipe 5–10 mm. long.

Cape.—East London, Buffalo River, *Dodd* 8051 ; Kei Mouth, *Flanagan* 83 ; *Flanagan* 2478 ; *Smith* 3784.

Natal.—Umzumbi, *Wood* 3009.

91. **C. oocarpa** *Bak.* in Kew Bull. (1897), 252. *C. pilosiflora Bak.* in Kew Bull, (1897), 251 ; Bak. f. 339.

A branching shrub ; branches pale green, softly and densely pilose. Leaves trifoliolate ; stipules linear, up to 4 mm. long, deciduous ; petioles usually more than one at a node, 4–22 mm. long, pilose ; leaflets oblong-elliptic, acute and apiculate, cuneate at the base into a small petiolule, glabrescent on the upper surface, thinly pilose on the lower. Racemes terminal and lateral, from lax to sub-dense. Flowers 1–1·5 cm. long ; pedicels 3–6 mm. long, pilose ; bracts linear, 4–7 mm. long, about as long as or longer than the pedicels. Calyx 6–9 mm. long, pilose ; lobes triangular, acuminate, longer then the tube. Standard appressedly pilose on the back. Keels bent almost at right angles in the lower half and ending in a long rather blunt beak, glabrous on the surface. Pods oblong in outline, 10–12 mm. long, sessile, pilose.

Nyasaland.—Nyika Plateau, *Whyte* no number ; between Mpata and commencement of Nyasa-Tanganyika Plateau, *Whyte* no number ; Kyimbila, *Stolz* 230.

92. **C. pauciflora** *Bak.* in Kew Bull. 251 (1897) ; Bak. f. 399.

A branching suffrutex ; branches pubescent with golden hairs. Leaves trifoliolate ; stipules small, subulate, deciduous ; petioles 2–5 mm. long ; thickly pubescent with golden-brown hairs ; leaflets obovate, 5–10 mm. long, 2–4 mm. broad, rounded and mucronate at the apex, cuneate at the base into a very small petiolule, glabrous on the upper surface, loosely appressedly pubescent on the lower. Flowers about 8 mm. long, 1–3 at the ends of the short rigid lateral shoots ; bracts small, subulate ; bracteoles at the base of the calyx ; pedicels 2–3 mm. long, densely pubescent. Calyx 4–5 mm. long, densely pubescent ; tube wide at the mouth, with the lobes abruptly contracted into narrow teeth ; lobes about as long as the tube or shorter. Standard densely pubescent on the back. Keels abruptly bent in the lower half and ending in a long, straight, blunt beak, glabrous on the surface. Pods shortly oblong-obovoid, 9–12 mm. long, 7–8 mm. broad, shortly stipitate, with the persistent style lateral, appressedly pubescent with golden hairs.

Nyasaland.—Nyika Plateau, *Whyte* no number.

93. **C. distans** *Benth.* in Hook. Lond. Journ. Bot. 2 : 582 (1843) ; Bak. f. 340.

A low slender plant much branched ; branches ascending, terete, faintly striate, puberulous. Leaves trifoliolate ; stipules small, 2–3 mm. long, subulate, reflexed ; petioles 5–15 mm. long ; leaflets oblong-linear or lanceolate, 5–37 mm. long, 1·5–7 mm. broad, somewhat cuneate at the base, rounded with a small mucro at the apex, appressedly pubescent beneath. Racemes leaf-opposed and terminal, very laxly 2–12-flowered. Flowers 7–14 mm. long ; pedicels 2–4 mm. long, pubescent ; bracts subulate, shorter than or as long as the pedicels, persistent ; bracteoles 2, minute at the base of the calyx. Calyx 3–5 mm. long, usually $\frac{1}{3}$ of the corolla, pubescent ; lobes deltoid, about as long as the tube. Standard pubescent on the back. Keels bent at right angles near the base and ending in a long straight beak, glabrous on the surface, ciliate on the upper margin. Pod ovoid to oblong in outline, 1–1·6 cm. long, 5–9 mm. broad, puberulus, sub-sessile.

Basutoland.—Leribe, *Dieterlen* 495.

Orange Free State.—Bloemfontein, *Potts* 2917 ; The Flats, *Barber* no number ; Marselles, *Dawson* in Govt. Herb. Pretoria 6439.

Natal.—Colenso, *Kuntze* 1050 ; no locality, *Gerrard* 1725 ; *Medley-Wood* 4479.

Transvaal.—Standerton, *Rehmann* 6787 ; Lay Spruit, *Burke* and *Zeyher* 369 ; Tal River, *Burke* no number ; Lydenburg, *Wilms* 343 ; Heidelberg, *Burtt-Davy in Govt. Herb.*, Pretoria 3133 ; Middelburg, *Burtt-Davy* 13325 ; Pretoria, *Pole-Evans* no number ; *Louw* 2.

Bechuanaland.—Vryburg, *Mogg* 8510 ; Mafeking, *Bolus* 6445.

Rhodesia.—Kafue, *Rogers* 8719.

94. **C. grantiana** *Harvey* in Harvey and Sonder, Fl. Cap. 2 : 43 (1861-62) ; Bak. f. 341.

A low slender branching herb ; branches terete, faintly striate, puberulus, ascending. Leaves trifoliolate ; stipules linear-subulate, 1–2 mm. long ; petioles 4–14 mm. long ; leaflets cuneate-oblong, 5–20 mm. long, 3–7 mm. broad, rounded or retuse at the apex, sometimes with a minute mucro, cuneate at the base, pubescent on the under surface. Flowers 1–3 at the ends of thread-like axillary peduncles and 3–5 in short leaf-opposed racemes, 7–9 mm. long ; pedicels thread-like, 4·5 mm. long, pubescent ; bracts subulate, 1–3 mm. long, when in pairs one longer than the other ; bracteoles minute, mostly in pairs near the base of the pedicels. Calyx 4–5 mm. long, pubescent ; lobes deltoid-acuminate, usually longer than the tube. Standard pubescent on the back. Keels bent at right angles near the base, ending in a straight beak ; beak up to 7 mm. long. Pods obovoid or shortly oblong-obovoid, about 10–13 mm. long, 6–9 mm. broad, pubescent, sub-sessile.

Natal.—Port Natal, *Grant* no number ; *Gerard* 1726 ; Umkomanzi, *Schlechter* 6698 ; Illovo, *Medley-Wood* 6435 ; Durban, *Medley-Wood* 11906 ; Inanda, *Medley-Wood* 614 ; Intshanga, *Medley-Wood* 9868.

East Griqualand.—Umzimkulu, *Tyson* 1250 ; 2798.

Orange Free State.—*Cooper* 2237. (Possibly Transvaal : Barberton, *Rogers* 23921).

95. **C. longistyla** *Bak. f.* in Journ. Bot. 58 : 75 (1920).

A branching suffrutex ; branches terete, shortly whitish tomentose. Leaves trifoliolate, sub-fasicled ; stipules obscure, subulate, 1–2 mm. long ; petioles varying from 1–10 mm. long, pubescent ; leaflets obovate, oblanceolate or elliptic oblanceolate, 4–20 mm. long, 2–10 mm. broad, pubescent on both surfaces, sometimes becoming glabrous above. Flowers about 1–1·7 cm. long, 1–3 on axillary peduncles or terminal on short lateral branchlets sometimes also in lax racemes ; peduncles or branches becoming rigid ; pedicels 3–5 mm. long, tomentose ; bracts subulate, about 2 mm. long ; bracteoles 2 on the pedicels, small, subulate. Calyx 6–8 mm. long, pubescent ; lobes deltoid, long acuminate, longer than the tube. Standard pubescent on the back. Keels bent in the lower half ending in a long sharp beak 1–1·4 cm. long, sometimes slightly hooked at the apex, glabrous. Pods shortly oblong-obovoid, about 1 cm. long, 6 mm. broad, softly pubescent, shortly stipitate.

Rhodesia.—Salisbury, *Rogers* 4064, *Eyles* 2156 ; Marindallas, *Mainwaring in Herb. Eyles* 3461.

Portuguese East Africa.—Zambesiland, *Stewart* no number ; Vila Pery, *Esselen* no number.

96. **C. virgulata** *Klotzsch* in Peters' Mossamb. Bot. 56 (1862). *C. virgatula, Bak.* in Fl. Trop. Africa 2 : 30. *C. Forbesii, Bak.* in Fl. Trop. Africa 2 : 18 (1871) ; Bak. f. 337.

A branching suffrutex ; branches terete, rather long, virgate, softly and loosely pubescent, becoming somewhat rigid. Leaves trifoliolate, 2–3 at a node ; stipules subulate, up to 2 mm. long ; petioles 1–10 mm. long ; leaflets varying in size, obovate to narrowly oblong-cuneate, 3–20 mm. long, 2–7 mm. broad, pubescent on both surfaces, sometimes becoming glabrous above. Flowers along the branches, about 1 cm. long, solitary in the axils of the leaves or in terminal and lateral few-flowered racemes ; peduncles persistent, becoming rigid ; pedicels 3–6 mm. long ; bracts subulate, up to 3 mm. long ; bracteoles 2, subulate, on the pedicels. Calyx 5–7 mm. long, pubescent ; lobes deltoid, acuminate, usually longer than the tube. Standard pubescent on the back. Keels bent at right-angles in the lower half and ending in a long straight sharp beak about 1 cm. or more long, glabrous on the surface. Pods small, obovoid, 8–15 mm. long, 4–6 mm. broad, puberulous, shortly stipitate.

Transvaal.—Komatipoort, *Rogers* 2680 ; Silwane, *Breyer* no number.

Bechuanaland.—Mochudi, *Rogers* 6735 ; *Harbor* no number.

Nyasaland.—*Buchanan* 1410 ; Shire Highlands, *Buchanan* 183 and 149 ; East Coast of Lake, *Johnson* 135.

Portuguese East Africa.—Sena, *Peters* no number ; Mozambique, *Forbes* no number ; Zambesiland, *Kirk* no number.

97. **C. leubnitziana** *Schinz* in Abhandl. Bot. Verein. Prov. Brand 30 : 158 (1888) ; Bak. f. 302.

Branches many from the woody root-stock, terete, strigose, with whitish hairs. Leaves trifoliolate ; stipules subulate, about 2 mm. long ; petioles 5–15 mm. long, strigose ; leaflets cuneate-obovate or elliptic-obovate, 7–23 mm. long, 3–10 mm. broad, rounded at the apex, retuse or with a minute mucro, cuneate at the base, strigose on the lower surface, glabrous above. Racemes fairly laxly 7–20-flowered, terminal or leaf-opposed, but crowning the plant. Flowers 1·1–1·3 cm. long ; pedicels about 2 mm. long ; bracts subulate, about as long as the pedicel ; bracteoles 2, at the base of the calyx. Calyx 6 mm. long, strigose pubescent ; lobes deltoid, acuminate, longer than the tube. Standard glabrous on the back or thinly strigose along the midrib. Keels bent abruptly in the lower half and ending in a long sharp beak about 1 cm. long, glabrous on the surface. Pods sub-globose, 7–8 mm. in diameter, very shortly pubescent, stipitate. (Very close to *C. aurea.*)

Great Namaqualand.—Tiras, *Schinz* 534 ; Kuibis, *Dinter* 1229, *Range* 838, *Dinter* 2201 ; Windhuk, *Rogers* 15169.

98. **C. Kurtii** *Schinz* in Viertelj. Nat. Ges. Zurich 52 : 422 (1907). *C. Dinteri Schinz* in Bull. Herb. Boiss. Ser. II, 3 : 819 (1903) ; Bak. f. 341.

Branches many from a short woody stem, slender, terete, strigose pubescent. Leaves trifoliolate ; stipules about 1 mm. long ; petioles 2–15 mm. long, appressedly pubescent ; leaflets oblong-cuneate to linear-oblong, 5–23 mm. long, 2–8 mm. broad, rounded at the apex, cuneate at the base, appressedly pubescent beneath and glabrous above. Racemes leaf-opposed, laxly few-flowered. Flowers 10–14 mm. long ; pedicels 3–6 mm. long ; bracts rather fleshy, 1–2 mm. long. Calyx 5–7 mm. long, pubescent ; lobes longer than the tube. Standard pubescent on the back. Keels bent abruptly in the lower half and ending in a long straight beak, glabrous on the surface. Pods oviform, 9–12 mm. long, about 6 mm. broad, shortly pubescent ; stipe 2–3 mm. long.

South-West Africa.—Waterberg, *Dinter* 583 ; Otavi, *Dinter* 5559 ; Auasbergen, *Dinter* 3500 ; Awas Mountains, *Pearson* 9674.

99. **C. Heidmannii** *Schinz* in Mem. Herb. Boiss. 1 : 128 (1900). *C. paucifolia*, *Schinz* in Viertelj. Nat. Ges. Zurich 42 : 420 (1907).

Annual, branching from the base ; branches numerous, strigose. Leaves trifoliolate ; stipules subulate, 1 mm. long ; petioles 7–15 mm. long, strigose ; leaflets linear, 1·5–4 cm. long, 1–3 mm. wide, minutely mucronate at the apex, obscurely petioluled at the base, strigose on both surfaces, the upper becoming glabrescent. Racemes very numerous, lax, terminal and lateral ; peduncles slender. Flowers 10–12 mm. long ; pedicels 5–6 mm. long, strigose ; bracts 1–2 mm. long. Calyx 6 mm. long, strigose ; lobes deltoid, acuminate, as long as or longer than the tube. Standard hairy on the back. Keels bent in the lower half and ending in a long beak, glabrous. Pod obovoid, 6–10 mm. long, about 5 mm. broad, shortly stipitate, pubescent, becoming glabrescent and transversely marked.

South-West Africa.—Gr. Barmen, *Dinter* 525.

100. **C. aurea** *Dinter* M.S. in Herb. Berol. ; Bak. f. 325.

Herb, branching from near the base ; branches softly appressedly pubescent. Leaves trifoliolate ; stipules about 2 mm. long ; petioles 1–1·5 cm. long, flattened or very narrowly winged ; leaflets linear-oblong, 1·5–3 cm. long, 3–8 mm. broad, rounded or retuse at the apex, or with a minute mucro, cuneate at the base into a very short petiolule, appressedly pubescent on the lower surface, glabrescent on the upper. Racemes leaf-opposed, much exceeding the leaves, lax, many flowered. Flowers 1·2–1·5 cm. long ; pedicels 3–4 mm. long ; bracts 2·5 mm. long ; bracteoles minute, at the base of the calyx. Calyx about 6 mm. long, appressedly pubescent ; lobes triangular, acute, about as long as the tube. Standard softly hairy on the back. Keels abruptly bent in the lower half and ending in a long beak, glabrous. Pods more or less globose, about 1·2 cm. in diameter, stipitate, softly hairy.

South-West Africa.—Okahanja, *Dinter* 524 ; Kinrib, *Fleck* 455.

101. **C. Macaulayae** *Bak. f.* 326.

Branches few, long, ascending, striate, pubescent. Leaves trifoliolate ; stipules linear-setaceous, 2–5 mm. long ; petioles 1–2·5 cm. long, flattened or grooved, pubescent, more or less patent, persistent ; leaflets linear, narrowly oblong to elliptic, 1·5–5 cm. long, 3–13 mm. broad, rounded retuse or minutely mucronate at the apex, slightly cuneate at the base into a petiolule, appressedly pubescent on the lower surface. Racemes elongating, laxly many flowered, leaf-opposed or terminal. Flowers 1·2–2·5 cm. long ; pedicels 4–6 mm. long ; bracts linear, acuminate into a dark subulate point, 2–4 mm. long ; bracteoles at the base of the calyx or on the calyx. Calyx 4–8 mm. long, appressedly pubescent ; lobes deltoid, acute, about as long as the tube. Standard pubescent on the back, rather large, enveloping the rest of the corolla. Keels abruptly bent in the lower half, ending in a long straight beak, glabrous, with a ciliate margin. Pods oblong-obovoid, less than twice as long as broad, 1–2 cm. long, 6–12 mm. broad, appressedly pubescent, sub-sessile.

Transvaal.—South African Goldfield, *Baines* no number ; Pietersburg, *Bolus* 10873.

Rhodesia.—Victoria Falls, *Allen* 255 ; Salisbury, *Mundy* 51 and 2810 ; Mumbwa, *Macaulay* 758.

102. **C. cinerea** *Burtt-Davy* MSS.

Suffrutex ; stems erect, grey silky, striate, branching above ; branches silky, ascending. Leaves trifoliolate ; stipules very small, subulate, recurved, sometimes absent ; petioles 1–5 mm. long, grey silky, somewhat flattened ; leaflets cuneate-oblong, 7–17 mm. long, rounded at the apex, with a small sharp mucro, cuneate at the base into a short petiolule, grey silky on the lower surface. Racemes terminal, closely 10–20 flowered. Flowers 6–9 mm. long ; bracts subulate, about half as long as the pedicels or longer ; pedicels 2·5–4·5 mm. long, usually bi-bracteolate near the apex, erect, and nodding at the apex. Calyx grey

silky, about half as long as the corolla ; lobes deltoid, about as long as the tube. Standard silky on the back. Keel bent almost at right-angles in the lower half and ending in a long straight beak, glabrous, ciliate on the upper margin. Pod obovoid, sometimes sub-globose, 7–9 mm. long, about 6 mm. broad, stipitate, appressedly silky.

Transvaal.—Barberton, *Galpin* 1328.

103. **C. caespitosa** *Bak.* in Kew Bull. (1897) 252 ; Bak. f. 335.

Branches herbaceous, numerous from a thick woody root, striate, flattened, strigose. Leaves trifoliolate ; stipules 2 mm. long ; petioles 3–5 mm. long, grooved above, strigose ; leaflets oblanceolate to oblong-cuneate, 1–2·5 cm. long, 3–8 mm. broad, rounded at the apex with a minute apiculus, cuneate at the base into a petiolule. Racemes terminal, many flowered. Flowers about 1 cm. long ; pedicels 4–6 mm. long, bracteate at the base and bi-bracteolate just below the middle ; bracts 2–3 mm. long ; bracteoles smaller. Calyx about 7 mm. long, strigose ; lobes triangular, acuminate, about as long as or longer than the tube. Standard somewhat hairy on the back near the apex. Keels bent abruptly in the lower half and ending in a long beak, glabrous. Pod shortly oblong in outline, laterally compressed, very oblique, 9–10 mm. long, 8–9 mm. broad, glabrous at maturity.

Nyasaland.—Mt. Malosa, *Whyte* no number.

104. **C. florida** *Welw.* ex Bak. in Fl. Trop. Africa 2 : 30 (1871) ; Hiern Cat. Welw. African Pl. 1 : 202 (1896) ; Bak. f. 293.

Shrubs with numerous silky deeply-furrowed virgate branches. Leaves trifoliolate ; stipules none ; petioles flattened, silky, 5–13 mm. long ; leaflets obovate or oblong-cuneate, broadly rounded at the apex, usually retuse, with an obscure mucro, or rounded and distinctly mucronate, 6–25 mm. long and 2–10 mm. broad, strigose beneath, more or less glabrous above. Flowers in many sessile terminal racemes forming a panicle, and solitary in the axils of the upper leaves. Flowers 8–12 mm. long ; bracts subulate, erect, shorter than the pedicels ; pedicels erect, nodding at the apex, 3–8 mm. long, silky, bi-bracteolate in upper half. Calyx silky, wide-mouthed ; lobes deltoid, as long as or shorter than the tube. Standard glabrous on the back, or obscurely few haired near the apex. Keels bent just below the middle, and ascending in a straight beak, glabrous. Pod sessile, globose, about 8 mm. long, silky.

Rhodesia.—Lukanda Valley, *Allen* 474.

105. **C. brachycarpa** *Burtt-Davy* MSS. *C. globifera E. Mey var. brachycarpa Benth.* in Hook. Lond. Journ. Bot. 2 : 581 (1843) ; Bak. f. 287.

Suffrutex with numerous stems from a woody base ; stems erect, simple or branching, finely strigose-silky. Leaves trifoliolate ; stipules small, subulate, usually recurved, sometimes absent ; petioles 6–14 mm. long, silky, slightly grooved above ; leaflets obovate, distinctly mucronate, cuneate into a petiolule, about 7–25 mm. long and 3–10 mm. broad, shortly strigose, becoming glabrous above. Racemes terminal, with flowers numerous. Flowers 7–11 mm. long ; bracts deciduous, subulate, erect, short or sometimes as long as the pedicel ; pedicels 1–3·5 mm. long, silky, erect and nodding at the apex, sometimes bracteolate near the apex. Calyx strigose-silky, about half as long as the corolla ; lobes lanceolate, usually longer than the tube. Standard glabrous on the back. Keel bent almost at right angles in the lower half and ending in a long straight blunt beak, glabrous, obscurely and shortly ciliate on the upper margins. Pod depressed globose, about 4mm. long and 5 mm. broad, silky, shortly stipitate.

Transvaal.—*Zeyher* 374 ; Pretoria, Magaliesberg, *Burke* 316, *Rehmann* 4398, *McLea* 5633 ; *Pole-Evans* no number, *Leendertz* 287 ; Waterberg, *Stent* no number, *Galpin* M. 536 ; Zoutpansberg, Messina, *Rogers* 20727.

106. **C. globifera** *E. Mey* Com. 24 (1835), Fl. Cap. 2 : 44 ; Bak. f. 287.

Suffrutex with many stems from a woody base ; branches long, ascending, strigose-silky. Leaves trifoliolate ; stipules small, subulate, usually reflexed, sometimes absent; petiole 5–17 mm. long, strigose, slender, channelled above ; leaflets cuneate-oblong, 1–2·5 cm. long, 3–7 mm. broad, rounded or retuse at the apex, usually with a small mucro, cuneate at the base, obviously petioluled, appressedly pubescent beneath, often glabrous above. Racemes terminal at the ends of long branches, with flowers numerous. Flowers 7–12 mm. long ; bracts subulate, often as long as the pedicel ; pedicel 4–7 mm. long, bi-bracteolate about mid-way or near the apex, erect and nodding at the apex. Calyx about half as long as the corolla, strigose silky, lobes deltoid, acute or rarely obtuse, about as long as the tube. Standard pubescent on the back sometimes almost glabrous except on the midrib. Keel bent almost at right angles in the lower half and ending in a long straight beak, glabrous, ciliate with longish soft white hairs on the upper margin. Pod obovoid-sub-globose, 8–10 mm. long, 5–7 mm. broad, stipitate, appressedly silky.

Natal.—*Wood* 12495, *Gerrard* 1721, *Gwenzius* no number, *Sanderson* 300 ; Durban, *Rogers* 1280, *Krauss* 341 and 440, *Harding* no number ; Greytown, *Wilms* 1957 ; Krantz Kloof, *Rogers* 24422 and 24688 ; Inanda, *Wood* 401 ; Maritzburg, *Mogg* 2167 and 6565, *Sutherland* no number, *Sim in Govt. Herb., Pretoria* 13075, *Mitchell in Govt. Herb, Pretoria* 16844 ; *Emberton, Schlechter* 3233 ; Tweedie, *Mogg* 3463 ; Pinetown, *Wood* 11466 ; Clairmont *Wood* 6134 ; Ixopo, *Webb in Govt. Herb., Pretoria* 16990.

Cape.—Eastern Province : Omsamcaba, *Dr ge* 1836 ; Clydesdale, *Tyson* 2049.

107. **C. aculeata** *De Wild.* in Ann. Mus. Congo Bot. ser. 4, 1 : 185. t. 46 (1902–3). *C. spinosa* subsp. *aculeata* Bak. f. 312. *C. spinosa var. macrocarpa* Bak. f. 312.

Branches virgate, terete, laxly-softly tomentellous ; branchlets short, 1–4 cm. long, bearing usually one flower and ending in a straight, sharp spine. Leaves sub-fascicled, varying much in size, trifoliolate ; stipules small, petioles 0·3-1·5 cm. long, narrowly winged ; leaflets oblong-cuneate, very shortly petioluled, rounded and retuse at the apex, sometimes with a small mucro, 0·5–2 cm. long, 2–7 mm. broad, glabrous on the upper surface, strigose beneath, with the intermediate larger than the lateral ones. Flowers 1·3–2 cm. long, usually solitary on the short spinous lateral branchlets, leaving a small scar after falling ; bracts 1–1·5 mm. long, subulate ; pedicels 3–4 mm. long, strigose, minutely bi-bracteolate. Calyx 5–8 mm. long, strigose ; the lobes deltoid, acuminate, as long or longer than the tube. Standard softly and conspicuously hairy on the back. Keel bent at right angles near the base and ending in a long acuminate straight beak. Pod obovate to oblong in outline, 1·5–3 cm. long, pubescent.

Rhodesia.—Chelange, *Rogers* 8470 ; Kalomo, *Rogers* 26017 and 8201 ; Kafue, *Rogers* 8719 ; Mumbwa, *Macaulay* 627.

Nyasaland.—Nychor Mts., *Whyte* no number.

108. **C. griquensis** *Bolus* in Journ. Linn. Soc. Bot. 24 (1887) 174 ; Bak. f. 311.

Branches dichotomously arranged, rigid, terete, white silky, ending in spines. Leaves trifoliolate ; petioles 2–5 mm. long ; stipules about 1 mm. long, subulate ; leaflets obovate, cuneate at the base into a very short petiolule, emarginate, 6–10 mm. long, usually folded, glabrous above, silky beneath, with the intermediate larger than the lateral ones. Flowers about 8 mm. long, racemose on the spines, 1–2 to each spine ; bracts minute ; pedicels slender, 2–5 mm. long, with a minute bracteole about midway. Calyx thinly silky, 2–4 mm. long, 5-lobed ; lobes deltoid, acute, about as long as the tube. Standard glabrous or sparsely silky on the midrib. Keel pouched in the lower half, ending in a straight beak. Pod sub-globose, stipitate, ending in an oblique persistent style-base, silky pubescent.

Cape.—Middelburg, Grootfontein, *Burtt-Davy* 9684.

Griqualand.—Kimberley, *Bolus* 6802, *Marloth* 408. Near the Vaal River, *Burchell* 1782, *Flanagan* 1434.

Orange Free State.—Boshoff, Smitskraal, *Burtt-Davy* 11337 and 10073.

Transvaal.—Bloemhof, Christiana, *Burtt-Davy* 13065 and 13139.

109. **C. erimicola** *Bak. f.* *C. spinosa var Schlechteri Bak. f.*, Bak. f. 311 and 312.

Branches virgate with numerous slender spines, terete, pubescent. Spines 0·5–2 cm. long. Leaves small, sub-fascicled, trifoliolate; petiole 1–3 mm. long, pubescent; stipule minute, subulate; leaflets small, oblanceolate to obovate, cuneate at the base into a very small petiolule, retuse at the apex or with a minute mucro 2–7 mm. long, glabrous on the upper surface, strigose beneath, with the intermediate larger than the lateral. Flowers varying in size from 6–12 mm. long, arising at the base of, or pendulus from the spines; pedicels strigose, 2–4 mm. long, minutely bracteate at the base and about midway. Calyx strigose, 2–4 mm. long, 5-lobed; lobes deltoid, about as long as the tube. Standard hairy at the apex on the back. Keel sharply bent in the lower half ending in a straight beak. Pod globose, like a pea, 4–7 mm. in diameter, tomentellous. ending in a persistent oblique style-base.

Transvval.—Pretoria, Magaliesberg, *Schlechter* 3675; Strubens Farm, *Mogg in Gort. Herb.* 10591; Pietersburg, *Bolus* 10914; Plains in Transvaal. *Bolus* 6437; Waterberg *Burtt-Davy* 7065, *Galpin* M. 726.

Griqualand.—Kimberley, Newlands, on banks of Harts River, *Wilman* in McGregor Museum, No. 2389.

Namaqualand.—Kalkfontein to Warmbad, *Dinter* 5126.

110. **C. anthyllopsis** *Welw.* ex Baker in Oliv. Fl Trop. Africa 2 : 15 (1871); Bak. f. 263.

Branches diffuse, pilose. Leaves unifoliolate, petiolate, of two forms, oblong-lanceolate and ovate, rounded at the base, at the apex with a small mucro, pilose; upper ones about 10 cm. long and 2 cm. broad; lower about 2·5 cm. long and 1·5 cm. broad, petiole 0·5–1 cm. long, pilose; stipules setaceous, pilose, 0·5–1·5 cm. long. Flowers about 7 mm. long, in terminal oblong heads; heads up to 5 cm. long. Calyx pilose, almost as long as the corolla, divided beyond the middle into linear-lanceolate teeth. Standard glabrous Keels rounded about the middle, broadly U-shaped, ending in a straight, sharp beak, glabrous on the surface. Pods small, obliquely oblong in outline, about 7 mm. long, densely villose.

Nyasaland.—*Buchanan* 884, 303, 453; Shire Highlands, *Buchanan* 447.

Northern Rhodesia.—Lusaka Vet. Off. A 3 in Nat. Herb., Pretoria.

Southern Rhodesia.—Rand 11, *Hislop* 151; Salisbury, *Eyles* 2153 *Godman* 126.

111. **C. kipandensis** *Bak. f.* in Journ. Linn. Soc. Bot. 42 : 266 (1914).

Branches erect, more or less pilose and rather densely leafy. Leaves unifoliolate, shortly petioled, ovate-oblong, 2·2 cm. long, 5 mm. broad, villose on both sides. Flowers many, in a dense terminal raceme. Bracts linear, villose, about as long as the flowers. Calyx villose, about 8 mm. long, almost as long as the corolla, divided beyond the middle. Standard villose on the back. Keel glabrous, bent below the middle and ending in a straight beak. Pod oblong in outline, about 8 mm. long, villose.

Rhodesia.—Near Mumbwa, *Macaulay* 672; Broken Hill, *Rogers* 8151 and 7678.

Nyasaland.—Shire Highlands, *Buchanan* 337.

112. **C. cylindrostachys** *Welw.* ex Bak. in Fl. Trop. Africa 2 : 15 (1871); Bak. f. 257.

Branches virgate, pilose. Leaves unifoliolate, petiolate, ovate or elliptic, 4–6 cm. long, 1·5–2·5 cm. broad, gland-dotted, more or less villose, acute; petiole 3–6 mm. long; stipules setaceous, 2–5 mm. long. Flowers many, in a dense terminal raceme, cernuous. Bracts linear, villose, about as long as the flowers. Calyx 4–5 mm. long, shorter than the corolla,

sparingly pilose ; lobes deltoid, about as long as the tube. Standard glabrous, with distinct veins. Keels rounded about the middle, broadly U-shaped, ending in a very short and blunt beak, glabrous on the surface. Pods sub-globose, pilose.

Rhodesia.—Victoria, *Munro* 1045 *in Herb. Mus. Brit.*

113. **C. calycina** *Schrank.* Pl. Rar. Hort. Monac. t. 12 (1819). Fl. Trop. Africa. 2 : 15 ; Bak. f. 271.

Branches virgate, pilose. Leaves unifoliolate, linear- to oblong-lanceolate, 5–10 cm. long, 6 10 mm. broad, finely gland-dotted, pilose beneath ; petiole about 2 mm. long. Flowers in lax terminal and lateral racemes ; bracts foliaceous, about half as long as the calyx, pilose. Calyx 2–2·5 cm. long, enclosing the corolla, deeply divided, pilose with long ferrugineous hairs on the outside, enlarging in fruit and enclosing the glabrous pod.

Rhodesia.—Kafue, *Rogers* 7638.

Southern Rhodesia or Portuguese East Africa (border), Lion's Creek, *Schlechter* 12210.

Nyasaland.—*Buchanan* 394.

114. **C. glauca** *Willd.* Sp. Pl. 3 : 974 (1800) ; Bak. f. 259.

Plant glaucous. Branches erect, slender, smooth, terete. Leaves variable ; the lower sometimes much broader than the upper, unifoliolate, linear-lanceolate to oblong, narrowing at the base into a very short petiole, acute, 2–9 cm. long, with the upper from 1 mm. broad and the lower up to 9 mm. broad, glaucous ; stipules absent. Racemes opposite the leaves, up to 10 cm. long, bearing from 2 to 5 flowers ; bracts subulate, about 2 mm. long ; pedicels about 4 mm. long, usually bi-bracteolate about the middle. Flowers about 7 mm. long. Calyx glaucous, up to 8 mm. long, 5-lobed ; lobes somewhat longer than the tube. Standard glabrous on the back. Keels broad, rounded about the middle, U-shaped, ending in a short beak, glabrous on the surface. Ovary oblong in outline, glabrous. Pod distinctly stipitate, narrowly oblong to oblong in outline, 1·5–3·5 cm. long, glabrous.

Rhodesia.—Lion's Creek, *Schlechter* 12217 ; Umtali, *Teague* 594.

var Welwitschii, Bak. f.

Leafy to the apex ; leaves about 3 cm. long and 7 mm. broad.

Rhodesia.—Mumbwa, *Macaulay* 705.

var. Elliotii, Bak. f.

Leaves very narrow and rather sparse ; pods narrower than the type.

Rhodesia.—Salisbury, *Godman* 100.

115. **C. bongensis** *var.* **shirensis** Bak. in f. Journ. Linn. Soc. Bot. 42 : 256 (1914).

An erect annual, small and slender, 15–20 cm. high ; branches filiform, thinly pubescent. Leaves unifoliolate, narrowly linear to linear-lanceolate, with the lower often much broader than the upper, 1–4 cm. long, varying in width from 1–7 mm., acute, cuneate, sessile, sparingly pubescent to almost glabrous ; stipules minute, subulate. Flowers 1–2 on long filiform leaf-opposed peduncles, about 5 mm. long. Pedicels short, about as long as the calyx ; bracts minute ; bracteoles at base of calyx, inconspicuous. Calyx about 2mm. long, strigose pubescent ; teeth slightly longer than the tube. Standard glabrous on the back. Keel bent in the lower half and ascending in a straight beak. Ovary pilose. Pod oblong in outline, 1–1·2 cm. long, thinly pilose, becoming glabrescent.

Nyasaland.—Shire Highlands, *Buchanan* 57.

Rhodesia.—Miami, *Rand* 23 Herb. Mus. Brit.

116. **C. incompta** *N. E. Br.* in Kew Bull. 1909 : 101 ; Bak. f. 262.

Herb, branching from the base ; branches somewhat fistular, angled, minutely pubescent. Leaves unifoliolate, linear-lanceolate, varying much in width, 2·5–9 cm. long, 2–6 mm. broad, acuminate, acute, petioled, glabrous above, shortly pubescent beneath ; petioles 8–12 mm. long ; stipules 2 mm. long. Racemes leaf-opposed, 2–4-flowered, 3–5 cm. long. Flowers 5–7 mm. long ; pedicels 3 mm. long, bracteate at the base and in the upper half ; bracts up to 2 mm. long. Calyx 5 mm. long, divided beyond the middle, appressedly pubescent. Standard glabrous. Keels rounded about the middle, somewhat boat-shaped, ending in a long sharp beak, glabrous on the surface. Pods not seen.

Ngamiland.—Botletle Valley, *Lugard* 205.

117. **C. Hislopii** *Corbishley* in Kew Bull. 1922, 27.

Herb branching from the base. Branches somewhat flattened, weak, thinly strigose. Leaves unifoliolate, difform, mostly long-acuminate, linear-lanceolate or ovate, usually 7–14 cm. long, 5–12 mm. broad, with a few 7 cm. long and 3·5 cm. broad, glabrous or thinly pubescent ; petiole flattened, 0·3–1·5 cm. long ; stipules linear-subulate, 0·3–1 cm. long. Racemes lax, leaf-opposed and longer than the subtending leaf. Flowers about 1 cm. long. Pedicels about 5 mm. long, bracteate at the base and bi-bracteolate in the lower half. Calyx about 1 cm. long, divided beyond the middle, strigose. Standard glabrous, bluish. Keel deeply rounded about the middle and ending in a stout beak ; beak horned near the apex. Pod oblong in outline, 2·5–3 cm. long, stipitate ; stipe up to 1 cm. long.

Rhodesia.—Salisbury, *Eyles* 2092, 2138 ; *Hislop* 155.

118. **C. spartea** *R. Br.* ex Baker in Fl. Trop. Africa, 2 : 12 (1876) ; Bak. f. 262.

Branches terete, fistular, sparingly strigose. Leaves unifoliolate, lanceolate-linear or lanceolate, with the lower broader than the upper, from about 4–11 cm. long, 2–12 mm. broad, narrowed at the base into a very short hairy petiole, acute, strigose, becoming glabrescent ; stipules subulate ; petiole about 1 mm. long. Racemes terminal, up to 12 cm. long, lax ; bracts subulate, 1–2 mm. long ; pedicels very slender, about 5 mm. long, strigose or tomentose, sometimes bi-bracteolate at the apex. Flowers about 7 mm. long. Calyx thinly hairy, 3 mm. long, 5-toothed ; teeth deltoid, acute, about as long as the tube. Standard glabrous on the back. Keels boat-shaped, ending in a straight beak. Ovary hairy along the upper suture. Pod oblong in outline, 1·5 cm. long, shortly stipitate, thinly strigose or glabrous.

Transvaal.—Barberton, *Rogers* 20073.

Nyasaland.—*Buchanan* 544, 323.

119. **C. Adamsonii** *Bak. f.* in Journ. Linn. Soc. Bot. 42 : 261 (1914).

Branches many from the same root, virgate angular and somewhat fistular. Leaves unifoliolate, oblong-lanceolate, 2·5–8 cm. long, 3–10 mm. broad, rounded at both ends, mucronate, thinly strigose-pubescent to almost glabrous, sub-sessile ; petiole 1 mm. long ; stipules small, 1–2 mm. long, setaceous. Racemes 1–3-flowered, about 7 cm. long. Flower about 9 mm. long ; bracts subulate, 2 mm. long ; pedicels 8 mm. long, strigose, bi-bracteolate at the apex. Calyx 7 mm. long, strigose ; lobes lanceolate, acute, longer than the tube. Standard strigose along the mid-rib on the back. Keels rounded about the middle, U-shaped, ending in a very short blunt beak. Pod not seen.

Zambesiland.—Shire Highlands, *Adamson* 321.

120. **C. virgultalis** *Burch.* in DC. Prodr. 2 : 128 (1825) ; Fl. Cap. 2 : 40 ; Bak. f. 269.

Branches virgate, striate, appressed-sericeous. Leaves rather sparse, unifoliolate, narrowly linear or linear-lanceolate, 3–4 cm. long, 2–3 mm. broad, cuneate at the base and jointed to a short petiole, obtuse or obscurely mucronate, appressedly hairy on both

surfaces ; petiole 1·5–5 mm. long ; stipules absent. Racemes terminal, lax, 4–14 cm. long ; bracts subulate, about 3 mm. long ; pedicels about 4–7 mm. long, silky, bi-bracteolate at the apex ; bracteoles similar to the bracts, but smaller. Flowers 1·3–2 cm. long. Calyx appressedly hairy, 7–9 mm. long, 5-lobed ; lobes deltoid, acute, about as long as the tube or somewhat longer. Standard sparingly hairy on the back. Keels bent in the lower half and ending in a long straight beak. Ovary oblong in outline, 5 mm. long ; style geniculate, 1·4 cm. long, pubescent. Pod ellipsoid, 1–1·5 cm. long, softly appressed-tomentellous, abruptly narrowed into the persistent rather thickened style.

Griqualand West.—Between the Vaal and Riet Rivers, *Burchell* 1752.

Bushmanland.—Sand dunes between Ougrabies and Aggenys, *Pearson* 2928.

Namaqualand.—*Wyley in Herb. Hooker* no number ; on Gariep, near Verleptram, *Drège* 1752 and 1836, *Pearson* 3712 and 7753.

Cape.—Prieska, *Bryant* 356.

No Locality.—*Dinter* 5040 and 4207.

121. **C. Allenii** *Verdoorn* n. sp.

Branches virgate, striate, thinly strigose or glabrous. Leaves rather sparse, unifoliolate, linear, 2–4 cm. long, 1·5–4 mm. broad, glabrous, articulated at the base to the petiole, obtuse ; petiole 1–1·7 cm. long ; stipules absent. Racemes terminal, few-flowered, lax, 4–12 cm. long ; bracts subulate, 1–2 mm. long ; pedicels 5–7 mm. long, glabrous or thinly strigose, minutely bi-bracteolate at the apex ; bracteoles similar to the bracts, but much smaller. Flowers 1·5–2 cm. long. Calyx glabrous or thinly strigose, 5–6 mm. long, 5-lobed ; lobes deltoid, acute, about as long as the tube. Standard thinly strigose on the back. Keels bent almost at right angles in the lower half and ending in a long straight beak. Ovary oblong in outline, appressed-pubescent. Pod not seen.

Southern Rhodesia.—Bulawayo, *Rogers* 13812 ; Victoria Falls, *Allan* 226.

C. Allenii *Verdoorn* sp. nov.

Rami virgati, striati, strigosi vel glabri. Folia pauca, simplicia, linearia, 2–4 cm. longa, 1·5–4 mm. lata, glabra, basi-articulata, apice obtusa ; petiolus 1–1·7 cm. longus ; stipulae nullae. Racemi terminales, pauciflori, 4–12 cm. longi ; bracteae subulatae, 1–2 mm. longae ; pedicelli 5–7 mm. longi, glabri vel sparse strigosi, apice bi-bracteolati. Flores 1·5–2 cm. longi. Calyx glaber vel sparse-strigosus. Vexillum dorso strigosum. Carina angulo recto curvata inde in rostrum attenuata.

122. **C. spartioides** *DC.* Prodr. 2 : 128 (1825) ; Fl. Cap. 2 : 40 ; Bak. f. 270 (partly).

Branches virgate, striate, sparsely strigose. Leaves few, unifoliolate, linear-acicular, 1–2·5 cm. long, 0·5–1·5 mm. broad, articulated at the base to a very short petiole, acute, strigose ; stipules absent. Racemes terminal, lax, up to 22 cm. long ; bracts subulate, up to 3 mm. long ; pedicels 4–6 mm. long, silky-strigose, minutely bibracteolate at the apex ; bracteoles similar to the bracts, but much smaller. Flowers 1–1·5 cm. long. Calyx appressedly hairy, 6 mm. long, 5-lobed ; lobes deltoid, acute, about as long as the tube. Standard silky-strigose on the back. Keels bent in the lower half, ending in an acuminate erect beak. Ovary oblong in outline, appressedly hairy. Pod ellipsoid, 1–1·3 cm. long, strigose, abruptly narrowed into the persistent rather thickened style.

Bechuanaland.—Chooi Desert, *Burchell* 2336 and 2407 ; near Malichwae, *Lugard* 232 ; Vryburg, *Burtt-Davy* 11194 and 13724.

123. **C. orientalis** *Burtt-Davy. C. spartioides, Harv.* Fl. Cap. 2 : 41 (partly), not of DC.

Branches virgate, striate, glabrous. Leaves few, unifoliolate, linear, acicular, 0·5–3 cm. long, 0·5–1 mm. broad, glabrous, articulated at the base to a petiole ; petiole 3–10 mm. long, resembling the leaf blade exactly ; stipules absent. Racemes terminal, lax, 5–12 cm.

long ; bracts subulate, 3–4 mm. long ; pedicels 0·5–1 cm. long, glabrous, bi-bracteolate about midway ; bracteoles similar to bracts, but smaller. Flowers about 1·5–2 cm. long. Calyx glabrous, 5–7 mm. long, 5-lobed ; lobes deltoid-acuminate, about as long as the tube. Standard strigose on the back, becoming glabrous. Keels bent abruptly in the lower half, ending in a very long straight beak. Ovary oblong in outline, appressedly hairy. Pod ellipsoid, 1–1·3 cm. long, glabrous and reticulate, abruptly narrowed into the persistent rather thickened style.

Orange Free State.—Rhinoster River, *Burke* 338, *Zeyher* 370.

Transvaal.—Matebe Valley, *Holub* no number ; Piet Retief, *Leipoldt* no number ; Zeerust, *Leendertz* 4258, *Burtt-Davy* 7185 ; Lichtenberg, *Leibenberg* 30.

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SOUTH AFRICAN GRAMINEAE.

An Undescribed Species of *Schmidtia*.

By Sydney M. Stent.

The genus *Schmidtia* is represented in South Africa by two species, *S. bulbosa* Stapf, a perennial known in the Karroo region as "Sandkweek" from its stoloniferous habit, and the annual species described in this article under the name of *S. kalihariensis*. Samples of this annual species are to be found in most of the South African herbaria named *S. bulbosa*, and many duplicates have been distributed under that name.

The two grasses are very similar in general appearance, but are easily distinguished by their very different habit. *S. bulbosa* is a distinct perennial, with a number of close-packed cataphylls at the base of the culms and creeping surface stolons. It is common in Bechuanaland and the western districts of Cape Province, Orange Free State and Transvaal. In the Vryburg district, where it covers large tracts of land, it is considered by most of the farmers a pest more difficult to eradicate than the troublesome steek grass (Mr. Pentz). There are, however, some farmers who claim for it a certain amount of food value, and assert that cattle graze it readily during the summer months.

S. kalihariensis is a tufted, much branched annual, with rather broader leaves than *S. bulbosa* and smaller and generally darker spikelets. It is spread widely over the Kalahari area, vast tracts of land being occupied by little else (Dr. Pole Evans). It is there known as "suur gras" and "Kalihari grass."

Farmers in the Upington district say that the grass is not eaten readily by stock when it is green, but that after it has been frosted it is eaten greedily (Dr. Pole Evans). In parts of South-West Africa, where it is the dominant grass, it is known as "bushman grass," and is much relished by stock. Its dense covering of glandular hairs makes it a sticky unpleasant grass to handle in its fresh green state (Dr. Pole Evans). Chemical analyses of air-dried material, made by the Chief Chemist, Department of Agriculture, in August 1923, is given as follows:—

	Per cent.		Per cent.
Moisture	8·14	Fibre	31·74
Protein	9·01	Carbohydrates	34·75
Fat	1·82	Ash	14·54

The ash content is high, but at that time this was not examined further.

In August, 1928, however, a further analysis was made of samples of this grass from the Upington district with a view to ascertaining more specially its phosphorus content (P_2O_5), and this was found to be unusually high, one sample giving 0·362 per cent. on the dry material—a higher figure than that given even by cultivated teff.

I have included a detailed description of *S. bulbosa* Stapf for purposes of comparison, as a certain amount of confusion has existed about the identity of the two grasses.

Schmidtia kalihariensis Stent, n. sp.

Tufted annual-culms geniculate or ascending up to 6·5 cm. high, 4–6-noded, repeatedly branched from the lower nodes, finely striate, more or less densely hirsute with tubercle based hairs, upper internodes long exserted, lower included or shortly exserted; *sheaths* of leaves loose, striate, densely hairy, with fine tubercle based gland-tipped hairs; basal not scale-like; *ligule* a fringe of hairs; *blades* linear lanceolate, long, tapering to an acute apex, 7–15 cm. long by 8–10 mm. broad, softly and densely hairy on both surfaces with gland-tipped hairs.

Panicle dense, linear or narrow oblong to lanceolate, contracted, spiciform, rarely somewhat lax, 5–15 cm. long by 2–4 cm. broad, rhachis and all divisions densely hairy; branches short, appressed to the rhachis or the lower, sometimes up to 4 cm. long and obliquely spreading; *spikelets* sessile, dark grey to greyish green, crowded from the base of branches, articulate above the glumes, usually 6-flowered, the lower perfect, the upper more or less reduced, internodes long bearded; *glumes* somewhat unequal, grey, delicately membranous, hairy all over with tubercle-based, occasionally gland-tipped hairs, prominently 7-nerved, nerves percurrent, except the marginal, which are usually evanescent above; lower glume the shorter, obtuse or narrowly truncate, about 6 mm. long, upper more broadly truncate and minutely toothed at the apex, about 7 mm. long; *valves* up to 4·5 mm. long (to tip of lobes), broadly cuneate, lobed to about one-third of length, long hairy on the back, 9-nerved or occasionally 11-nerved, lobes obtuse, glabrous dark grey, the body of the valve being usually pallid; awns 4–7 mm. long, scabrid; callus long-bearded; *pale* shorter than the valve or sub-equalling it, lanceolate cuneate, 2-keeled from the base to minutely bi-dentate tip, keels shortly ciliate with acute mixed with occasional longer gland-tipped hairs; flaps very narrow, about 0·12 mm. wide, long silky towards the base; *lodicules* 2, minute, cuneate, sub 5-nerved, fleshy, yellowish or colourless, with few cilia from the more or less toothed apex; *stamens* 3, anthers about 2 mm. long; *ovary* cuneate, stipitate; styles quite separate, short, stigmas rather broadly plumose and slightly longer than the styles; *grain* about 2 mm. long, oblong cuneate, light straw coloured and opaque to translucent golden brown, embryo equalling about half the grain, hilum oblong, minute.

Cape Province.—Kalihari region, Upington, *Borchards* (Nat. Herb. H. 21496 and 21522); Kuruman, sand dunes at Vischkat, *Pole Evans* 2090 and 2058; Hay District, near Griquatown, *Daniels* (Nat. Herb. H. 21480); Kimberley District: Kimberley, *Burger* (Nat. Herb. H.) 21772; Vryburg District: Vryburg, *Butler* (Nat. Herb. H. 10996): Little Bushmanland, Kraaiwater, *Schlechter* 84.

Schmidtia bulbosa Stapf.

Perennial on a short creeping rhizome, sending out rather long surface stolons. *Culms* finely ribbed, rather densely hairy with acute hairs mingled with gland-tufted hairs, erect or geniculately ascending, simple or more usually branched from the lower nodes, 3–5 or more noded, lower internodes short, included or shortly exserted, uppermost often long exserted and equalling half the length of the culm. *Sheaths* of the leaves loose, finely ribbed, more or less densely hairy, the lowest short and scale-like; *ligule* a line of stiff hairs; *blades* linear lanceolate, tapering to a setaceous point, flat, about 5 mm. wide at the base and 5–12 cm. long, the primary nerves (7) distinct on the lower surface, less so on the upper, both surfaces densely hairy, margins scabrid, colour glaucous green. *Panicle* narrow, somewhat contracted, about 6–11 cm. long by 2–3 cm. broad, the lower branches up to 3 cm. long, sometimes spreading, rhachis and all divisions of the panicle hairy; *spikelets* shortly pedicelled to sub-sessile, disarticulating readily above the glumes more tardily between the valves, rather pallid, 6–8-flowered internodes between the florets, long bearded; *glumes* somewhat unequal, greenish grey, glabrous or sparsely and shortly hairy, 7-nerved, with a few irregular transverse veins, mid nerve percurrent or minutely excurrent, middle lateral nerves evanescent just below the tip, others evanescent lower down, keels usually quite smooth but occasionally scabrid; *lower glume* 5–7 mm. long, rather broad, and sub-acute or minutely emarginate, upper 7–8 mm. long, narrower than the lower, sub-acute; *valves* broadly cuneate, about 7 mm. long (from base to tips of lobes), long hairy and scabrid on the back, lobed to nearly the middle; lobes 6, sub-acute to minutely obtuse, pale coloured like the body of valve; awns about 8 mm. long, scabrid; callus short and long bearded; *pale* slightly shorter than valve, lanceolate, strongly keeled to the minutely bilobed tip, keels rigidly ciliate, flaps about 0·3 mm. wide and long hairy; *lodicules* minute, yellow, linear trigonous, fleshy, 2-toothed, with occasionally 1–2 gland-tipped hairs from summit; *stamens* 3, anthers about 2 mm. long; *ovary* oblong cuneate; styles separate. Grain about 1·5 mm. long oblong, light golden brown, embryo occupying about two-thirds of the whole; hilum minute, oblong.

Throughout the western district of the Orange Free State and Transvaal, and the Vryburg–Kimberley area of the Cape Province.

There is no record in the National Herbarium of this species from the Kalihari regions, where its place is apparently taken by the annual *S. kalihariensis*.

Schmidtia kalihariensis Stent, sp. n.

Gramen annunum plus minus totum glanduloso-pilosum. Culmi geniculati vel ascendentes, ad 65 cm. alti, multi ramosi ; *vaginae* foliorum laxae, inferiores non squamuliformae ; *laminae* longe et tenuiter acuminatae, 7–15 cm. longae, 8–10 mm. latae. *Panicula* densa, coartata, 5–15 cm. longa, 2–4 cm. lata ; rami brevi rhachis appressi. *Spiculae* sessiles, plumbeae vel plumbeo-virides, dense confertae, 6-floribus ; *glumae* dense hirsutae, prominente 7-nervatae ; nervi percurrentes ; gluma inferior 6 mm. longa, gluma superior 7 mm. longa, apice truncato et minute dentato ; *valvae* ad 4·5 mm. longae, lobae inclusae, plerumque pallidae lobis plumbis ; lobae 1–5 mm. longae, obtusae vel sub-acutae ; aristae 4–6 mm. longae ; *paleae* marginibus inflexis 0·12 mm. latibus ; *lodiculi* minuti, apicis minute-dentatibus et sparse hirsutibus ; *antherae* 3, circ. 2 mm. longae ; *ovarium* cuneatum, stipitatum ; *styli* distincti, brevi quam stigmatam paulam latam parce breviores.

Caryopsis circ. 2 mm. longa, embryo circ. 1 mm. longo.

THE SOUTH AFRICAN SPECIES OF THE MELIOLINEAE

By E. M. Doidge and H. Sydow.

The earliest knowledge of the South African species of the *Meliolineae* is due to the collections of MacOwan and Medley Wood, which were described for the most part by Kalchbrenner and Cooke (3, 14-15), and to descriptions of later collections published by Sydow (17–19).

In an account of the South African Perisporiales published in 1917 (4), some 32 species were mentioned, and since that date a considerable number of South African *Meliolineae* have been described in various publications (5–10, 19, 24, 26).

The type specimens of fungi collected in other parts of the world, are not easily accessible to workers in South Africa. The revision of a group of fungi can therefore be most effectively accomplished in collaboration with a mycologist in Europe, who is familiar with species from all parts of the world and has access to most of the type species. The present revision is the result of such a collaboration, and includes descriptions of 72 species belonging to four genera.

GEOGRAPHICAL DISTRIBUTION.

The distribution of the *Meliolineae* in South Africa corresponds to a large extent with the distribution of the indigenous timber forests; that is to say, they are found mostly on the seaward slopes of mountains within less than 100 miles of the coast. A few species have also been found in scattered bush in kloofs and ravines further inland; the scrub forest near the coast also yields a number of species.

The largest forest area is in the Cape Province, between the Outeniqua Mountains and the sea, and extending from George, through Knysna to the Humansdorp Division. *Meliolineae* are plentiful in these forests, and a number of collections have been made in different localities.

In the Eastern Conservancy, the Pirie Forest in the neighbourhood of Kingwilliamstown has, on two or three occasions, been explored for fungi of this group, but very little systematic collecting has been done in the forests of the Transkei, Natal (except the Karkloof) and Zululand. It is more than likely that there are many species in these forests still unknown and undescribed. The Woodbush forests in the Transvaal have also yielded a number of interesting fungi.

The individual species are not as a rule, confined to certain definite localities, but their geographical range appears to be coincident with that of the host plant. For example, *Meliola ganglifera* may be found wherever the Assegai (*Curtisia faginea*) grows, and certain species on yellow-wood (*Podocarpus spp.*), and on black ironwood (*Olea laurifolia*) occur wherever these trees are found from the Cape to Natal and in the Northern Transvaal.

TAXONOMIC.

The *Meliolineae* is a group of fungi with extremely wide geographic distribution in the warmer countries of the world, and consists of a small group of genera with the characters originally described for the genus *Meliola*. They are superficial fungi with a conspicuous and characteristic mycelium, spherical perithecia (except in *Amazonia* where they are dimidiate at maturity), and comparatively large 3–4 septate, brown spores.

The genus *Meliola* was established by Fries (11) in 1825, and in 1851 the first general discussion of the genus was given by Bornet (2): six species were then known. Gaillard's monograph, "Le Genre Meliola" (12), included 111 species.

In the majority of the species of *Meliola* the mycelium is furnished with characteristic capitate hyphopodia, but in a few species these are absent or rudimentary. In 1914, Sydow (20) separated these species from the genus *Meliola*, under the generic name *Meliolina* (Type *M. cladotricha Lev.*); and in 1917 the genus *Irene* was established by Theissen and Sydow (21) for *Meliola* species with mycelium and perithecia devoid of setae, the type being the South African species *Irene inermis* (K. and C.), Th. et Syd.

The genus *Amazonia* Theissen (22) comprises a few species with typically *Meliola*-like mycelium and spores, but with perithecia which are dimidiate at maturity. On account of the form of the perithecia this genus was placed in the family *Microthyriaceae* (22, 23), but van Höhnel has shown (13) that under the brown shield-like cover a completely closed perithecium, pale and thin-walled, exists. This can therefore be properly regarded as a transition genus between *Meliola* and the *Microthyriaceae*.

Certain species included by Theissen and Sydow in the genus *Irene*, have curious vermiform appendages on the perithecia. This was regarded by van Höhnel (13A) as a distinction of generic importance, and he established for them the genus *Appendiculella* [Type *A. calostroma* (Desm.) v. Höhn.].

In 1920 Beeli (1) gave a synopsis of 459 species, including a fifth genus (*Meliolinopsis*, asci persistent, 8-spored) and introduced an extremely useful system of group numbers.

The monograph published by Stevens (16) in 1927-28, brought up the number of known species to close on 1,000; these species he classified under seven genera. In addition to those mentioned above (but excluding *Meliolinopsis*) he included *Actinodothis* Syd. (Phil. Jour. Sci. Bot. 9, 1914) with dimidiate perithecia and no free mycelium. The genus *Appendiculella* v. Höhn. is regarded by Stevens as synonymous with *Irene* Theiss. and Syd. on the grounds that the perithecia of the type species of the genus *Irene* (*I. inermis*) possess vermiform appendages.

Irene inermis is a species indigenous to South Africa and it has been possible to examine abundant material from different localities. The outer walls of the perithecial wall are extremely irregular and protuberant, many of them being produced into irregularly conical or horn-shaped processes up to 25 μ long, [not as long as 60 μ as previously stated (4)]. These, however, are not typical vermiform appendages, such as are found on perithecia of *Appendiculella calostroma*. If it is intended, therefore, to maintain the smaller Meliolaceous genera, it would be preferable to retain van Höhnel's original nomenclature.

Stevens has further established the genus *Irenopsis*, to include species without mycelial setae, but with true setae (not vermiform appendages), on the perithecium.

Both these genera, namely, *Appendiculella* and *Irenopsis*, can only be regarded as weak genera. In the case of *Appendiculella* there are too many transitions between forms with larviform appendages and forms devoid of such appendages, so that as in the case of *Irene inermis*, there may be difference of opinion as to whether a species should be placed in one or the other genus. In the case of *Irenopsis* there are species with perithecial setae which also have mycelial setae and are classified with the Meliolas; the species with perithecial setae are thus divided between the two genera.

We have preferred, therefore, in the present revision, to reunite *Appendiculella* with *Irene*, and *Irenopsis* with *Meliola*, retaining only the genera *Amazonia*, *Meliolina*, *Irene* and *Meliola*. It is doubtful whether the genus *Amazonia* can logically be maintained, as there are a number of transition forms between species with globose, and species with typically dimidiate perithecia. *Meliola Goniomae* is a case in point: this species was originally described as an *Amazonia*, the immature perithecia being distinctly dimidiate, but as these usually become globose at maturity, this fungus more properly belongs to the genus *Meliola*, The position of the genus, however, is left for future consideration after a larger number of species has been examined.

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EXPLANATORY.

The numbers given in square brackets are those of the Cryptogamic section of the National Herbarium.

The formulae at the beginning of each description are those of the extremely useful system of group numbers introduced by Beeli (1) and modified by Stevens (16).

The significance of these numbers is as follows :—

I. Main characters (numbers at left of period).

(1) Spores.
- 1.....2 septate.
- 2.....3 septate.
- 3.....4 septate.
- 4.....5 septate.

(2) Perithecia.
- 1.....With no setae or vermiform appendage.
- 2.....Bearing thick, cutinised vermiform appendages.
- 3.....Bearing uncinate or spiralled setae.
- 4.....Bearing setae, not uncinate or spiralled.

(3) Mycelial setae.
- 0.....Absent.
- 1.....Simple, entire, straight or nearly so.
- 2.....Simple, entire, but uncinate.
- 3.....Dentate, notched or forked (teeth less then 40 μ long).
- 4.....Branches subdivided or of over 40 μ in length.

(4) Capitate hyphopodia.
- 0.....Absent.
- 1.....Alternate or unilateral.
- 2.....Opposite.
- 3.....Both alternate and opposite.

II. Measurements (numbers on right of period).

(5) Spore length.
- 1.....20 μ long or less.
- 2.....30 μ long or less.
- 3.....40 μ long or less.
- 4.....50 μ long or less.
- 5.....60 μ long or less.
- 6.....over 60 μ long.

(6) Spore breadth.
- 1.....10 μ or less.
- 2.....20 μ or less.
- 3.....30 μ or less.
- 4.....over 30 μ.

(7) Perithecium (diameter).
- 1.....100 μ or less.
- 2.....200 μ or less.
- 3.....300 μ or less.
- 4.....Over 300 μ.

(8) Mycelial setae (length).
- 0.....Absent.
- 1.....300 μ or less.
- 2.....500 μ or less.
- 3.....1,000 μ or less.
- 4.....More than 1,000 μ.

KEY TO GENERA OF *MELIOLINEAE*.

A.—Perithecia typically dimidiate at maturity.....1. *Amazonia*.
B.—Perithecia globose, not dimidiate at maturity.

(*a*) Mycelium devoid of hyphopodia.....2. *Meliolina*.
(*b*) Mycelium with typical capitate hyphopodia.

1. Mycelium devoid of setae.....3. *Irene*.
2. Mycelium with setae.....4. *Meliola*.

AMAZONIA (Theiss.).

Ann. Myc 11, p. 499 (1913).

Syn. *Meliolaster* Doidge (nec van Höhnel), Trans. Roy. Soc. South Africa 8, p. 123 (1920).

Mycelium superficial, with hyphopodia, *Meliola*-like. Outer perithecial wall radial, shield-like, hemispherical, inverse; inner wall pale, thin, completely closed. Asci aparaphysate 2-spored, clavate. Spores 4-septate.

Amazonia asterinoides (Winter) Theiss.

Ann. Myc. 11, p. 499 (1913).

Meliola asterinoides Winter, Hedwigea 25, p. 96 (1886).

Meliolaster Mackenzii Doidge, Trans. Roy. Soc. South Africa 8, p. 123 (1920).

Hypophyllous, colonies minute, round, 1·5–2·5 mm. diameter; mycelium composed of brown hyphae 6–7 μ thick, flexuous or almost straight; branches alternate; cells 15–16 μ long. Capitate hyphopodia alternate or unilateral, very briefly stipitate, curved, 10–15$\times$ 6–7 μ; head cell sub-globose or ovoid, convex. Mucronate hyphopodia ampulliform, scattered amongst the capitate hyphopodia, sometimes sub-uncinate at the apex, 12–15$\times$ 6–7 μ. Mycelial setae none. Perithecia dimidiate, radiate, 250–350 μ diameter, composed of straight hyphae 4–6 μ thick, with cells about 10 μ long, fimbriate at the margin. Asci aparaphysate, evanescent, ellipsoid, 2-spored, 50–57 $\times$ 20–23 μ. Spores cylindrical or subclavate, 4-septate brown, rounded at both ends, slightly constricted, 33–37$\times$10–13·5 μ.

Host: *Piper capensis* L.f., 17.8.18, Buccleuch, Natal, Doidge [11570].

MELIOLINA (Syd.).

Ann. Myc. 12, p. 553 (1914).

Mycelium superficial, brown, reticulate, without hyphopodia, but with setae Perithecia arising from the mycelium, black, leathery or carbonaceous, without a true ostiole, with or without setae. Asci aparaphysate, usually 2–3-spored, thick-walled, ellipsoid. Spores brown, 3 or 4-septate.

Meliolina cladotricha (Lev.) Syd.

Ann. Myc. 12, p. 553 (1914). Stevens Ann. Myc. 25, p. 419 (1927).

Syn. *Meliola cladotricha* Lev., Ann. Sc. Nat. Ser. 3. Bot. 5, p. 266 (1846).

Amphigenous, forming thick, black, velvety spots 2–5 mm. diameter, frequently confluent. Mycelium composed of branched hyphae, 6–8 μ thick, with remote articulations. Mycelial setae opaque at the base, paler at the summit, bifid, each division giving rise to two or three branches with acute apices. There are frequently groups of crystals of calcium oxalate at the tips of the setae. Perithecia black, globose, 300–400 μ diameter, with granular surface. Asci ovoid with a very short foot, 2-spored. Spores 3-septate, constricted, attenuate towards the ends, 65–70$\times$18–22 μ.

Host: *Eugenia Gerrardi* Sim, Woodbush, Northern Transvaal, 3.8.11. Doidge [1759], same locality, 16.9.23 Doidge [17754].

IRENE (Theiss. et Syd.).

Ann. Myc. 15, p. 194 (1917).

Syn. *Irenina* Stevens, Ann. Myc. 25, p. 411 (1927).

Mycelium superficial, brown, reticulate, with hyphopodia, but without setae. Perithecia arising from the mycelium, black, leathery or carbonaceous, smooth or verrucose, without setae and with or without typical larviform appendages, without a true ostiole, parenchymatous. Asci aparaphysate, usually 2 3-spored, thick walled ellipsoid. Spores brown, 3–4-septate.

I. Spores with typical, larviform appendages. (*Appendiculella* van Höhn., Sitzber. K. Akad. Wiss. Wien. Math.-naturw. Kl. 128, p. 556, 1919).

A.—Spores 3-septate, capitate hyphopodia lobed.

1. Spores 50–60 μ long..... 1. *I. speciosa.*
2. Spores 40–50 μ long.
   - (*a*) Spores deeply constricted..... 2. *I. natalensis.*
   - (*b*) Spores slightly constricted.
     - o. Stalk cell of capitate hyphopodia short, straight, cylindrical..... 3. *I. calostroma.*
     - oo. Stalk cell long, often flexuous or curved.... 4. *I. gloriosa.*

II. Perithecia without typical larviform appendages.

A.—Spores 3-septate.

- (*a*) Capitate hyphopodia lobed..... 5. *I. Peddieae.*
- (*b*) Capitate hyphopodia not lobed..... 6. *I. Podocarpi.*

B.—Spores 4-septate.

1. Surface cells of perithecium, prolonged into conical or horn-shaped processes not more than 25–30 μ long (not typical vermiform appendages).
   - (*a*) Capitate hyphopodia, lobed..... 7. *I. Rinoreae.*
   - (*b*) Capitate hyphopodia, not lobed..... 8. *I. inermis.*
2. Surface cells of perithecium mammillate.
   - (*a*) Spores 50–60 μ long..... 9. *I. ditricha.*
   - (*b*) Spores 45–50 μ long.....10. *I. Nuxiae.*
   - (*c*) Spores 30–45 μ long.....11. *I. Peglerae.*
3. Surface cells of perithecium, rounded or broadly conical.
   - (*a*) Capitate hyphopodia, lobed or sub-lobed.
     - x. Spores 50–55 μ long.
       - o. Spores cylindrical, cells equal.....12. *I. atra.*
       - oo. Spores ellipsoid, medial cell larger....13. *I. implicata.*
     - xx. Spores 40–45 μ long.....10. *I. Zeyheri.*
     - xxx. Spores 35–40 μ long.....15. *I. scabra.*
   - (*b*) Capitate hyphopodia, not lobed.
     - x. Head cell of capitate hyphopodia, ovoid or globose.....16. *I. glabra.*
     - xx. Head cell, cylindrical.....17. *I. Strophanthi.*

1. **Irene speciosa** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1920); Stevens, Ann. Myc. 25 p. 422 (1927).

Syn. *Meliola speciosa* Doidge, Trans. Roy. Soc. South Africa 5, p. 726 (1917).

Group number 2201. 5330.

Hypophyllous, forming round irregular spots, 1–5 mm. diameter. Mycelium radiating, compact; hyphae brown, straight, 7–10 μ thick; cells short, up to 25 μ long, but frequently only 18 μ; branches usually opposite. Capitate hyphopodia crowded, alternate, usually one to each cell, large, showy; stipe cell cylindrical, somewhat attenuate towards the base,

7–11 μ long and 5·5–7 μ broad ; head cell broader than long, 20–25 μ broad and 18–22 μ long, irregular in form, 2–4-lobed, each lobe being concave or bi-lobulate. Mucronate hyphopodia very scarce, slender, pale and curved, about 25 × 7 μ. Perithecia grouped in the centre of the colony, black, globose, carbonaceous, 200–260 μ diameter ; surface cells conical, certain of them being produced into sub-cylindrical larviform appendages curving upwards, 70–90 μ long, 18–25 μ thick at the base, and tapering somewhat towards the tip. Asci 2-spored, evanescent. Spores ellipsoid, 3-septate, scarcely constricted at the septa, 50–60 × 20–25 μ.

Host : *Gymnosporia* sp. Woodbush, Northern Transvaal, 2.8.11, Doidge [1740].
The material is scanty and parasitised.

2. **Irene natalensis** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1920) ; Stevens, Ann. Myc. 25, p. 422 (1927).

Syn. *Meliola natalensis* Doidge, Trans. Roy. Soc. South Africa 5, p. 724 (1917).
Meliola natalensis, vars. *laxa* Doidge and *conferta* Doidge, Trans. Roy. Soc. South Africa 5, p. 724 (1917).
Meliola conferta Doidge, Trans. Roy. Soc. South Africa 5, p. 724 (1917).
Irene natalensis, vars. *laxa* (Doidge) Stevens and *conferta* (Doidge) Stevens, Ann. Myc. 25, p. 422 (1927).

Group number 2203. 4230.

Amphigenous, mostly epiphyllous, forming round to irregular, black, carbonaceous spots 1–3 mm. diameter, or diffuse and not forming definite spots. Mycelium radiating, varying very much in different collections ; sometimes very compact, with regular opposite branches and stiff straight hyphae ; sometimes diffuse, irregularly branched, and with more or less sinuous hyphae. Hyphae deep fuscous brown, 6–8 μ thick, cells 11–40 μ long. Capitate hyphopodia alternate (one to each cell, or more distant) or opposite and crowded, stipitate, 14–21 μ high ; stipe cell short, attenuate towards the base ; head cell broader than long, usually 2–3-lobed, lobes usually concave or bi-lobulate, 9–14 μ long and 11–20 μ broad. Mucronate hyphopodia not numerous (more frequent on the diffuse mycelium), scattered, slender, straight, or with a curved neck, 16–18 × 4–5 μ. Perithecia scattered or grouped near the centre of the mycelium, black, globose, carbonaceous, 180–250 μ diameter ; surface cells of the perithecia conical, many of them being produced into sub-cylindrical larviform appendages, which are 40–55 μ long, 18–20 μ broad at the base, and tapering somewhat to the recurved tip. Asci 2-spored. Spores 3-septate, cylindrical or somewhat ellipsoid deeply constricted at the septa, 40–45 × 14–16·5 μ, straight or slightly curved, rounded at both ends.

Hosts : *Doryalis rhamnoides* Harv., near Durban, Natal, 14.5.97, Medley Wood [345] ; Umgeni Beach, Durban, 4.6.12, Pole Evans [2412] ; Umgeni Beach, 27.5.15, Doidge [8980] ; Hilton Road, Natal, 21.7.18, Doidge [11608] ; Langholm Estates, Bathurst Dist., Cape Province, 14.7.19, Doidge [12347] ; Karkloof, Natal, 14.7.21, Doidge [14950] ; The Wilderness, George, 10.5.23, Doidge [17118] ; Van Stadens Pass, Cape Province, 19.5.23, Doidge [17256] ; East London, 19.7.19, Doidge [12429].

Doryalis rotundifolia Thunb., Kowie, Cape Province, 15.7.19, Doidge [12363], same locality, 9.11.19, Britten [14222].

Scolopia Mundtii Arn., Louis Trichardt, Northern Transvaal, 8.4.19, Putterill [11827] ; Haenertsburg, 14.9.23, Doidge [17772] ; Woodbush, 16.9.23, Doidge [17758].

This is a species of very variable habit, and there is very conceivable intermediate form between the *conferta* type (*e.g.*, 345), with compact mycelium and crowded, opposite hyphopodia, and the *laxa* type (*e.g.*, 11608), with diffuse mycelium and remote, alternate hyphopodia. These extremes can therefore no longer be regarded as distinct varieties.

3. **Irene calostroma** (Desm. v. Höhnel).

Ann. Myc. 16, p. 213 (1918), Stevens, Ann. Myc. 25, p. 432 (1927).
Syn. *Sphaeria calostroma* Desm., Bull. Soc. Bot. France 4, p. 1011 (1857).

Chaetosphaeria calostroma (Desm.) Sacc., Syll. Fung. 2, p. 95 (1883).
Meliola puiggarii Speg., Bull. Acad. Nac. Cient. Cordoba 11, No. 288 (1889).
Meliola autumnalis Syd., Ann. Myc. 2, p. 169 (1904).
Meliola rubicola P. Henn., Hedwigia 43, p. 140 (1904).
Meliola calostroma (Desm.) v. Höhn., Sitzber. K. Akad. Wiss. Wien. Math-natur. Kl. 128, p. 156 (1919).
Appendiculella calostroma (Desm.) v. Höhn., Sitzber. K. Akad. Wiss. Wien. Math-natur. Kl. 128, p. 556 (1919).
Irene puiggarii (Speg.) Doidge, South African Journ. Nat. Hist. 2, p. 39 (1920). See also Trans. Roy. Soc. South Africa 5, pp. 723–724 (1917) and 7, pp. 195–197 (1919).

Group number 2201. 4230.

Amphigenous, mostly epiphyllous, forming black, orbicular or irregular, thinly carbonaceous spots 2–5 mm. diameter, these frequently become confluent and cover the greater part of the leaf surface. Mycelium fuscous, rather pale, radiating, consisting of straight or sinuous hyphae 6·5–8 μ thick, branching irregularly and anastomosing to form a rather open network; branches opposite or unilateral; cells usually 25–30 μ long. Capitate hyphopodia alternate, rather distant, usually one to each cell, stipitate, 20–30 μ long; stipe cell short, cylindrical, or somewhat attenuate towards the base, about the same thickness as the hypha; head cell 16–20 μ broad, truncate, or more frequently with 2–3 shallow lobes; lobes truncate, rounded or more or less concave. Mucronate hyphopodia interspersed with the capitate hyphopodia, fairly numerous, opposite or unilateral, occasionally two being borne close together on the same side of the hypha, slightly paler, ampulliform, 14–24 $\times$ 6–8 μ, narrowed suddenly near the apex into a short neck. Perithecia usually in a small group in the centre of the colony, black, globose, carbonaceous, 200–250 μ diameter; surface cells conical to mammillate, round to polygonal at the base and 16–20 μ diameter, certain cells being prolonged into brown, chitinous, sub-cylindrical, larviform appendages, which are 60–110 μ long and 20–26 μ thick at the base, recurved at the apex and tapering to a point. Asci 2–3-spored, evanescent. Spores 3-septate, cylindrical, straight or slightly curved, similar in colour to the hyphae, scarcely constricted at the septa, rounded at both ends, 40–45 $\times$ 13–14 μ.

Hosts: *Cliffortia ferruginea*, L. fil., Van Stadens Pass, Cape Province, 13.11.17., Doidge [10861].

Cliffortia strobilifera Murr., Van Stadens Pass, Cape Province, 13.11.17, Doidge [10859]; Pole Evans, 17.5.18 [11442].

Leucosidea sericea Eck. and Zey., Nottingham Road, Natal, 8.4.17, van der Bijl [11357] Tugela Valley, near Mont aux Sources, 14.5.20, Doidge [14130].

Pygeum africanum Hook. fil., Woodbush, Northern Transvaal, 3.8.11, Doidge [1761].

Rubus pinnatus Willd., Woodbush, 5.8.11, Doidge [1771]; Knysna, 3.6.12, Pienaar [2425]; Buccleuch, Natal, 20.4.16, Sim [10150]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12278]; Storms River, Humansdorp District, 15.5.23, Doidge [17185].

Rubus rigidus Sm., Inanda, Natal, June 1881, Medley Wood [9503]; Winters Kloof, Natal, 26.6.11, Doidge [1574]; Woodbush, 18.9.23, Doidge [17735].

4. **Irene gloriosa** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1920); Stevens, Ann. Myc. 25, p. 422 (1927).

Syn. *Meliola gloriosa* Doidge, Trans. Roy. Soc. South Africa 8, p. 139 (1920).

Group number 2201. 4240.

Hypophyllous, rusty brown, forming round colonies, 5–10 mm. diameter, which frequently show fairly distinct, concentric zoning. Mycelium radiating, arachnoid, consisting of slender fuscous hyphae 4·6·5 μ thick, which are tortuous, densely interwoven, and with cells 30–50 μ long; branching irregular. Capitate hyphopodia alternate or unilateral, remote (many cells not producing hyphopodia), slender, stipitate, 30–80 μ long; stipe cells 14–64 μ long, cylindrical, as thick as the hyphae, or somewhat attenuate towards the

base, sometimes prolonged and 1-septate and variously bent and curved ; head cell about 16 μ long and 13–20 μ broad, very diverse in form, often sub-lobed and not infrequently inversely triangular. Mucronate hyphopodia sparse, paler than the hyphae, slender, lageniform, often gibbose, 18–20 $\times$ 5–6 μ. Perithecia numerous, flattened-globose, black, carbonaceous, 300–350 μ diameter, with very numerous ascending larviform appendages, 65–80 μ long and 25–30 μ thick at the base, tapering to the apex which is often recurved. Asci evanescent. Spores 3-septate, ellipsoid, scarcely constricted or slightly so, straight or somewhat curved, rounded at both ends, 45–50 $\times$ 15–18 μ.

Host : *Celastrus ?cordatus*, Buccleuch, Natal, 17.7.18, Doidge [11565].

5. **Irene Peddieae** Doidge.

Bothalia 2, p. 235 (1927).

Group number 2101. 4230.

Amphigenous, mostly epiphyllous, forming dark, round to irregular blotches up to 10 mm. diameter. Mycelium brown, forming a rather dense network ; hyphae 6–7 μ thick, sinuous, with opposite branches ; cells about 30–35 μ long ; capitate hyphopodia alternate, not crowded, usually one to each cell, 24–30 μ high, stalk cell cylindrical or becoming slightly thicker from the base upwards, head cell irregularly 2–4-lobed ; lobes rounded, flattened or bi-lobulate, 15–20 μ broad. Mucronate hyphopodia not very numerous, opposite, alternate or unilateral, lageniform, straight, curved or gibbose, 17–20 μ high, 6–7 μ thick. Perithecia scattered, spherical, 200–240 μ diameter, without appendages, collapsing at maturity, formed of cells about 10 μ diameter. Spores brown, 3-septate, straight or slightly curved, oblong, rounded at both ends, somewhat constricted at the septa, 40–44 $\times$ 15–16·5 μ.

Host : *Peddiea africana*, Harv., Louis Trichardt, Northern Transvaal, 8.4.19, Putterill [11840] ; Woodbush, Northern Transvaal, 16.9.23, Doidge [17777].

6. **Irene Podocarpi** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1920).

Syn. *Meliola Podocarpi* Doidge, Trans. Roy. Soc. South Africa 5, p. 725 (1917).

Irene anisomera Syd., Ann. Myc. 15, p. 194 (1917).

Irenina Podocarpi (Doidge), Stevens, Ann. Myc. 25, p. 447 (1927).

Group number 2101. 5230.

Amphigenous but mostly epiphyllous, forming thin, black colonies 2–5 mm. diameter, frequently confluent. Mycelium dark brown, branching very regularly and anastomosing to form a rather open network. Hyphae mostly straight, but at times somewhat sinuous, 6–7 μ thick ; composed of cells 16–20 μ long ; branches opposite. Capitate hyphopodia alternate, usually one to each cell, very briefly stipitate, 14–16 μ long ; head cell globose or broadly ovate 16–12 $\times$ 10–11 μ. Mucronate hyphopodia not seen. Perithecia, scattered or in small groups, with numerous slender hyphae radiating from the base, black, globose, carbonaceous, 200–250 μ diameter ; cells of perithecial wall conical. Asci 2–4-spored. Spores 3-septate, brown, constricted at the septa, tapering somewhat to the rounded ends and usually slightly curved, 50–56 $\times$ 14–16 μ ; the two central cells being larger than the terminal ones, and when the spore is immature, darker in colour.

Hosts : *Podocarpus elongata* L' Herit., Woodbush, Northern Transvaal, 4.8.11, Doidge [1822] ; Fort Cunninghame, Cape Province, March 1915 [8897] ; Buccleuch, Natal, 17.7.18, Doidge [11561] ; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12322] ; Karkloof, Natal, 14.7.21, Doidge [14967] ; Storms River, Humansdorp District, 15.5.23, Doidge [17166] ; Deepwalls, Knysna, 13.5.23, Doidge [17217].

Podocarpus falcata R. Br., Buccleuch, Natal, 17.7.18, Doidge [11552].

Podocarpus Thunbergii Hook, Woodbush, March 1910, Gray [889] ; Woodbush, 3.8.11, Doidge [1748] ; Tabankulu, Pondoland, 15.3.15, Fraser [8889] ; Tabankulu, 4.4.15 [9102] ; Duncairn, Natal, 13.7.21, Doidge [14960 and 14968].

7. **Irene Rinoreae** Doidge.

Bothalia 1, p. 80 (1922).

Syn. *Irenina Rinoreae* (Doidge) Stevens, Ann. Myc. 25, p. 468 (1927).

Group number 3101. 4320.

Amphigenous, forming small, round, dull-black colonies 1–4 mm. in diameter, usually scattered but occasionally numerous and confluent. Mycelium brown, reticulate; hyphae straight, 6–7 μ thick; cells mostly 18–20 μ long; branches opposite or unilateral, anastomosing. Capitate hyphopodia alternate, usually one to each cell, stipitate, 17–26 μ high; stipe cell short, cylindrical; head cell 17–20 μ broad, variously lobed; lobes rounded or truncate. Mucronate hyphopodia rather numerous, paler, opposite or alternate, interspersed with the capitate hyphopodia, lageniform or almost cylindrical with rather thick, curved necks, 17–20 μ long and 5–6 μ thick at the base. Perithecia black, globose, carbonaceous, 140–200 μ diameter, surface cells conical or rounded, some projecting to a height of 16–18 μ. Asci fugaceous, not seen. Spores 4-septate, cylindrical, rounded at both ends constricted at the septa, 40–46 × 16·5–21·5 μ.

Host: *Rinorea ardesiaeflora* Welw., Winters Kloof, Natal, 13.9.19, Doidge [12445]; Karkloof, Natal, 14.7.21, Doidge [14961 and 14969].

The material is very scanty; the fungus occurs sparsely on the leaves, and only a few colonies can be found even by careful searching.

8. **Irene inermis** (Kalch. et Cke.) Theiss. et Syd.

Ann. Myc. 15, p. 194 (1917); Stevens, Ann. Myc. 25, p. 429 (1927).

Syn. *Meliola quinqueseptata* Rehm., Ascomycetes p. 492.

Meliola inermis Kalch. et Cke., Grev. 9, p. 34 (1880); Trans. Roy. Soc. South Africa 5, p. 730 (1917).

Meliola acervata Ell. et Ev., Bull. Turrey Bot. Club 24, p. 126 (1897).

Group number 3101. 4230.

Amphigenous, but mostly epiphyllous, forming small, black, thinly carbonaceous colonies 1–3 mm. in diameter, sometimes very numerous and becoming confluent. Mycelium brown, radiating; hyphae 6·5–9 μ thick, sinuous, composed of cells 18–24 μ long, branches usually opposite and at an acute angle with the hyphae. Capitate hyphopodia alternate, usually one to each cell, stipitate, 16–30 μ long; stipe cell cylindrical, about the same thickness as the hypha; head cell ovate or globose, rarely truncate, 13–17 μ long and 10–13 μ broad. Mucronate hyphopodia not very numerous, usually on separate short branches near the centre of the colony, opposite, ampulliform, with a short neck, 14–18 μ long. Perithecia scattered, black, globose, carbonaceous, 200–270 μ diameter; surface cells irregularly rounded or conical, rarely mammillate, often produced into irregularly conical or horn-shaped processes up to 25 μ long, 14–18 μ diameter at the base. Asci 2-spored, evanescent. Spores 4-septate, ellipsoid, constricted at the septa, rounded at both ends, 35–45 × 13–15 μ.

Hosts: *Buddleia auriculata* Benth., Nottingham Road, Natal, 8.4.17, van der Bijl [11359]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12327]; Langholm Estates, Bathurst Dist., 14.7.19, Doidge [12354]; Woodbush, Northern Transvaal, 18.9.23, Doidge [17764].

Buddleia pulchella N.E. Br., Amanzimtoti, Natal, 10.7.11, Doidge [1571]; Buccleuch, Natal, 17.7.18, Doidge [11568]; Zwartkop, near Pietermaritzburg, Natal, 17.7.18, Doidge [11602].

Buddleia salvifolia Lam., Woodbush, Northern Transvaal, 2.8.11, Doidge [1742]; Buccleuch, Natal, 20.4.16, Sim [10146]; Nottingham Road, Natal, 5.4.17, van der Bijl [11356]; Mont aux Sources, Natal, 20.5.20, Doidge [14127]; Deep Walls, Knysna, 13.5.23, Doidge [17211]; Long Ridge, Knysna Dist., 14.5.23, Doidge [17229]; Woodbush, Northern Transvaal, 16.9.23, Doidge [17765].

Chilianthus dyssophyllus Benth., Buccleuch, Natal, 17.7.18, Doidge [11583].

9. **Irene ditricha** (Kalch. et Cke.) Doidge.

South African Journ. Nat. Hist. 2, p. 41 (1920).

Syn. *Asterina ditricha* Kalch. et Cke., Grevillea 9, p. 32 (1880).

Meliola ditricha (Kalch. et Cke.) Doidge, Trans. Roy. Soc. South Africa 5, p. 728 (1917), 8, p. 138 (1920).

Irenina ditricha (Doidge) Stevens, Ann. Myc. 25, p. 467 (1927).

Group number 3101. 5340.

Amphigenous, forming crustaceous, dense black colonies 2–3 mm., rarely up to 5 mm. in diameter. Mycelium dark brown, radiating, dense, branching freely, compact, terminal branches and hyphopodia often closely crowded, 7–10 μ thick, often rugose and uneven in thickness, consisting of cells 18–21 μ long; branches usually opposite. Capitate hyphopodia alternate, usually one to each cell, clavate, stipitate, 25–35 μ long; stipe cell short, cylindrical or attenuate towards the base; head cell irregular in shape, variously lobed, 18–25 μ long and 14–22 μ broad. Mucronate hyphopodia fairly numerous, on separate short branches or interspersed with the capitate hyphopodia, opposite or unilateral, slender lageniform with rather a thick neck, 21–25 $\times$ 7–8 μ. Perithecia grouped in the centre of the mycelium, spherical, black, opaque, 280–320 μ diameter; wall consisting of large cells of varying size, which are produced into opaque black conical or mammillate papillae, 30–40 μ long and 25–35 μ broad at the base. Asci 2-spored or more rarely 3-spored, evanescent. Spores 4-septate, very dark brown, cylindrical or ellipsoid, slightly constricted at the septa, rounded at both ends, 50–57 $\times$ 20–25 μ.

Hosts: *Celastrus spp.*, Inanda, Natal, May 1876, Medley Wood (Wood 3) [11518]; Buccleuch, Natal, 17.7.18, Doidge [11579].

Pleurostylia capensis Oliv., Van Stadens Pass, Cape Province, 13.11.17, Doidge [10883].

10. **Irene Nuxiae** Syd. n. sp.

Sub. *Meliola Heudeloti* Gaill., Trans. Roy. Soc. South Africa 5 (1917).

Irene Heudeloti (Gaill.) Doidge, South African Journ. Nat. Hist. 2, p. 40 (1920).

Irenina Heudeloti (Gaill.) Stevens, Ann. Myc. 25, p. 459 (1927).

Group number 3101. 4330.

Amphigenous, but mostly epiphyllous, forming thin, black, orbicular, crustaceous spots 2–4 mm. diameter. Mycelium not very dense, composed of rather light brown hyphae, which are straight or somewhat sinuous, slightly constricted at the septa, 5–8 μ thick; cells 15–30 μ long; branches opposite, making an acute angle with the main hyphae. Capitate hyphopodia fairly numerous, usually one to each cell, alternate or unilateral, stipitate, 16–20 μ long; stalk cell short, cylindrical or tapering somewhat towards the base; head cell globose ovoid, broadly rounded or truncate above, 11–16 $\times$ 9–11 μ. Mucronate hyphopodia fairly numerous, developing chiefly in the centre of the colony, opposite, usually on separate short branches, rarely interspersed with the capitate hyphopodia, 15–18 μ long, lageniform. Perithecia fairly numerous, scattered, black, globose, carbonaceous, 180–220 μ diameter; surface cells irregular, 15–30 μ diameter, grossly mammillate, with their apices curved or bent laterally. Asci 2-spored, ovate, very briefly pedicellate. Spores 4-septate, brown, cylindrical-compressed, broadly rounded at both ends, slight constricted, 45–50 $\times$ 18–22 μ.

Hosts: *Nuxia floribunda* Benth., Woodbush, Northern Transvaal, 3.8.11, Doidge [1776]; Van Stadens Pass, Cape Province, 9.3.16, Bottomley [9554], same locality 13.11.17, Doidge [10874]; Woodville Forest, George, 11.11.17, Doidge [10942]; Van Stadens Pass, 17.5.18, Pole Evans [11441]; Louis Trichardt, Transvaal, 8.4.19, Putterill [11837]; Buccleuch, Natal, 17.7.18, Doidge [11571]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12284]; Karkloof, Natal, 14.7.21, Doidge [14944]; Storms River, Humansdorp Dist., 15.5.23, Doidge [17181]; Keurkloof Forest, George, 9.5.23, Doidge [17107]; Deepwalls, Knysna, 13.5.23, Doidge [17212]; Van Stadens Pass, 19.5.23, Doidge [17261]; Woodbush, 16.9.23, Doidge [17745].

Nuxia tomentosa Sond., Woodbush, 3.8.11 and 16.9.23, Doidge [1746 and 17743].

This species is extremely common on *Nuxia floribunda* in all the forest areas.

11. **Irene Peglerae** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1929); Stevens, Ann. Myc. 25, p. 427 (1927).

Syn. *Meliola Peglerae* Doidge, Trans. Roy. Soc. South Africa 5, p. 730 (1917).

Group number 3201. 3220.

Epiphyllous, forming sub-crustaceous, black, orbicular colonies, 1–3 mm. diameter, or covering larger areas by confluence. Hyphae brown, straight, 7–9 μ thick, very frequently septate; cells 8–14 μ long; branches opposite, forming an acute angle with the main hyphae. Capitate hyphopodia alternate, very numerous, usually one to each cell, appressed towards the hyphae, 20–25 μ long; stipe cell short, 4–7 μ long; head cell obovoid to cylindrical, straight or recurved, 14–18 $\times$ 7–11 μ. Mucronate hyphopodia few in number, opposite, ampulliform, 14–22 $\times$ 7 μ. Perithecia crowded together in the centre of the colony, black, globose, carbonaceous, 125–235 μ diameter; surface cells mammillate. Asci 2–4-spored, evanescent. Spores 4-septate, brown, oblong, rounded at both ends, slightly constricted, 29–43 $\times$ 16–18 μ.

Hosts: *Anastrabe integerrima* E. Mey., Kentani, Cape Province, 4.6.12, Pegler [2363]; Umgeni, Natal, 16.7.15, Medley Wood [9036].

Bowkeria triphylla Harv., Buccleuch, Natal, 17.7.18, Doidge [11572].

Halleria elliptica L., Woodville Forest, George, 11.11.17, Doidge [10932].

Halleria lucida L., Keurkloof Forest, George, 9.5.23, Doidge [17116]; Storms River, Humansdorp Dist., 15.5.23, Doidge [17182]; Deep Walls, Knysna, 13.5.23, Doidge [17200].

12. **Irene atra** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1920).

Syn. *Meliola atra* Doidge, Trans. Roy. Soc. of South Africa 8, p. 137 (1920).

Irenina atra (Doidge) Stevens, Ann. Myc. 25, p. 466 (1927).

Group number 3101. 5320.

Amphigenous, mostly epiphyllous; colonies black, crustaceous, compact, round to irregular, up to 3 mm. diameter; leaf tissues discoloured under the mycelium. Mycelium dark brown, radiating and copiously branched; hyphae almost straight, 8–10 μ thick, composed of short cells 12–16 μ long, often slightly constricted at the septa; branches usually opposite, widely divergent, often almost at right angles to the main hypha. Capitate hyphopodia numerous, alternate or unilateral, usually one to each cell of the hypha, briefly stipitate, 20–27 $\times$ 16–20 μ; stipe cell short, cylindrical, not broader than the hyphae; head cell broad, irregularly 2–4 (usually 3) lobed; lobes truncate and rounded or bi-tri-lobulate. Mucronate hyphopodia not numerous, interspersed with the capitate hyphopodia, opposite or unilateral, pyriform or lageniform, not paler than the hyphae, 10–13 $\times$ 6–7 μ. Perithecia scattered, black, carbonaceous, 150–200 μ diameter (immature); asci not seen. Spores broadly ellipsoid, 4-septate, very slightly constricted, rounded at both ends, 50–54 $\times$ 20–25 μ.

Host: *Eugenia sp.*, Zwartkop, near Pietermaritzburg, Natal, 19.7.18 and 6.9.19, Doidge [11594 and 12436].

The fungus is rather scanty, although copious material of the host was collected; and 11594 is heavily parasitised.

13. **Irene implicata** Doidge.

Bothalia 1, p. 206 (1924).

Syn. *Irenina implicata* (Doidge) Stevens, Ann. Myc. 25, p. 465 (1927).

Group number 3103. 5330.

Mycelium hypophyllous, forming rather indefinite, round, grey-black spots, 2–4 mm. diameter. Hyphae pale fuscous, rather thin-walled, sub-torulose, 5·6–6·6 μ thick, branching irregularly, anastomosing and forming a tangled network amongst the lepidote scales on the under side of the leaf; cells variable in length. Capitate hyphopodia usually alternate or unilateral, sometimes opposite, stipitate, 20–40 $\times$ 10·20 μ; stipe cell usually cylindrical

or attenuate towards the base, 3·5–16 μ in length ; head cell very variable in form and dimensions, club-shaped, truncate or variously and fantastically lobed. Mucronate hyphopodia solitary, opposite or in whorls of three, slender, lageniform, straight or curved, 16–27 × 5–6·5 μ. Perithecia crowded together in the centre of the mycelium, globose, somewhat flattened, verrucose, carbonaceous, 240–290 μ diameter, collapsing at maturity ; outer wall composed of rounded or conical cells which are irregularly polygonal at the base and about 10 μ in diameter. Asci 2-spored, evanescent. Spores brown, 4-septate, ellipsoid, constricted at the septa, straight or slightly curved, tapering somewhat towards the rounded ends, 50–54 μ long ; medial cell longer than the others and 20–23·5 μ broad ; terminal cells not more than 13–14 μ broad.

Host : *Chilianthus arboreus*, A.D.C., Van Stadens Pass, Cape Province, 19.5.23, Doidge [17251] ; Deepwalls, Knysna, 23.2.25, Phillips [20345].

14. **Irene Zeyheri** Doidge.

Bothalia 1, p. 75 (1922).

Syn. *Irenina Zeyheri* (Doidge) Stevens, Ann. Myc. 25, p. 467 (1927).

Group number 3101. 4230.

Amphigenous, forming thin black spots 2–4 mm. diameter, or becoming confluent and covering larger areas. Mycelium not dense, forming an irregular network ; hyphae straight or somewhat sinuous, 6–6·5 μ thick, cells 20–30 μ long, branches opposite or irregular, anastomosing. Capitate hyphopodia alternate, usually one to each cell, 18–23 μ long ; stipe cell cylindrical ; head cell variable in form, ovate, sub-lobed or irregularly lobed, 6–14 μ broad at the apex. Mucronate hyphopodia opposite or unilateral, interspersed with the capitate hyphopodia, ampulliform 16–20 × 6–7 μ. Perithecia scattered, black, globose, carbonaceous, 180–240 μ diameter, surface cells rounded or conical. Asci 2-spored, evanescent. Spores oblong, brown 4-septate, slightly constricted, rounded at both ends, 39–44 × 16–18 μ.

Host : *Eugenia Zeyheri* Harv., Kentani, Cape Province, 3.6.15, Pegler [9126] ; Van Stadens Pass, Cape Province, 13.11.17, Doidge [10878] ; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12272] ; Howiesons Poort, Grahamstown, 12.7.19, Doidge [12388] ; Fern Kloof, Grahamstown, 8.12.18, Britten [14211] ; Van Stadens Pass, 19.5.23, Doidge [17264].

15. **Irene scabra** Doidge.

South African Journ. Nat. Hist. 2, p. 40 (1920).

Syn. *Meliola scabra*, Doidge, Trans. Roy. Soc. South Africa 7, p. 194 (1919).

Irenina scabra (Doidge) Stevens, Ann. Myc. 25, p. 464 (1927).

Group number 3101. 3230.

Amphigenous, forming thin black colonies 5–10 μ diameter. Hyphae straight or somewhat flexuous, 6–7 μ thick, with opposite branches and cells 24–30 μ long. Capitate hyphopodia alternate, usually one to each cell, briefly stipitate, 23–38 μ long ; stipe cell 6–14 μ long, cylindrical ; head cell ovate or bent, often irregularly sub-lobed. Mucronate hyphopodia interspersed with the capitate hyphopodia, opposite or unilateral, lageniform, neck sometimes curved. Perithecia black, carbonaceous, globose, 200–250 μ diameter ; surface cells rounded or conical. Asci 2-spored. Spores 4-septate, cylindrical, broadly rounded at both ends, scarcely constricted at the septa, 36–40 × 14–17 μ.

Hosts : *Trichocladus crinitus* Pers., Woodville Forest, George, 11.11.17, Doidge [10939] ; Izelini Forest, Kingwilliamstown, 22.6.18, [11611] ; Deepwalls, Knysna, 7.3.25, Phillips [20382].

Trichocladus ellipticus Eckl. and Zey., Tabankulu, Transkei, 15.3.14, Fraser [8891] ; Branders High Forest, Victoria East, 14.8.15, Van der Bijl [9462] ; Hogg's Back, Cape Province, 15.1.18, Henderson [11338] ; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12298].

The material is poor and badly parasitised.

16. **Irene glabra** (Berk. & Curt.) Doidge.

South African Journ. Nat. Hist. 2, p. 41 (1920).

Syn. *Meliola glabra* Berk. et Curt., Journ. Linn. Soc. Lond. 20, p. 392 (1869).

Irene glabra (Berk. and Curt.) Toro, Mycol. 17, p. 239 (1925).

Irenina glabra (Berk. and Curt.) Stevens, Ann. Myc. 25, p. 461 (1927).

Group number 3101. 4230.

Amphigenous, but most frequently epiphyllous, forming black crustaceous spots 2–3 mm. diameter. Hyphae light brown, straight, 7–9 μ thick, rather frequently septate (cells 25–30 μ long), constricted at the septa; branches opposite, emerging at an acute angle with the hyphae. Capitate hyphopodia fairly numerous, usually one to each cell, alternate or unilateral, 18–25 μ long; stipe cell short; head cell ovoid, globose or sub-lobed, 11–14·5 $\times$ 11 μ. Mucronate hyphopodia not very numerous, ampulliform, about 14 μ long, neck short and thick. Perithecia grouped to the number of 8 to 10 in the centre of the colony black, globose, carbonaceous 150–180 μ diameter; superficial cells mostly rounded or broadly conical, but forming occasionally conical protuberances rounded at the top. Asci ovoid-oblong, 2–4-spored. Spores brown, 4-septate, cylindrical, broadly rounded at both ends, slightly constricted, 40–45 $\times$ 16–18 μ.

Hosts: *Canthium* sp., Woodbush, Northern Transvaal, 3.8.11, Doidge [1780].

Pavetta sp., Woodbush, 4.8.11, Doidge [1834].

Kraussia lanceolata Sond., Van Stadens Pass, Cape Province, 13.11.17, Doidge [10871].

Rubiaceae undet., Langholm Estates, Bathurst District, 14.7.19, Doidge [12367].

17. **Irene Strophanthi** Doidge.

South African Journ. Nat. Hist. 2, p. 41 (1920).

Syn. *Meliola strophanthi* Doidge, Trans. Roy. Soc. South Africa 5, p. 729 (1917).

Irenina strophanthi Stevens, Ann. Myc. 25, p. 460 (1927).

Group number 3101. 4230.

Amphigenous, mostly hypophyllous, forming minute, black, round to irregular, sub-crustaceous colonies 1–3 mm. diameter. Mycelium radiating, hyphae brown, straight or somewhat sinuous, 6–9 μ thick, composed of cells 18–27 μ long; branches usually opposite. Capitate hyphopodia alternate, usually one to each cell, briefly stipitate, 20–25 μ long; head cell cylindrical, straight or slightly curved, rounded at the apex, 16–18 μ long and 7–9 μ thick. Mucronate hyphopodia not very numerous, interspersed with the capitate hyphopodia, opposite or unilateral, ampulliform with a short neck, 12–20 μ long. Perithecia scattered, black, globose, carbonaceous 180–240 μ diameter; surface cells rounded or broadly conical. Spores 4-septate, cylindrical, very slightly constricted at the septa, broadly rounded at both ends, 40–45 $\times$ 16–18 μ.

Host: *Strophanthus* speciosa Reber, Woodbush, Northern Transvaal, 3.8.11, Doidge [1781]; Buccleuch, Natal, 24.3.16, Doidge [9702]; Woodbush, 10.9.23, Doidge [17717].

MELIOLA (Fries.).

Systema orb. veg. p. 111 (1825), Emend. Bornet. Ann. Sci. Nat. Bot. Ser. 3. 16, p. 257 (1851).

Syn. *Myxothecium* Kze. Weigelt exs. sine no. (1827).

Mycelium superficial, brown, reticulate, with hyphopodia and with setae except in some species with setose perithecia. Perithecia with or without setae, but with no larviform appendages, arising from the mycelium, black, leathery or carbonaceous, without a true ostiole. Asci aparaphysate usually 2–3-spored, thick-walled, ellipsoid. Spores brown 3–4-septate.

KEY TO THE SECTIONS OF *MELIOLA*.

A.—Spores 3-septate.....Section A, Species 1–5.
B.—Spores 4-septate.
(*a*) Perithecia setose—
1. Mycelium not setose.....Section B, Species 6–8.
2. Mycelium setose.....Section C, Species 9.
(*b*) Perithecia not setose—
1. Mycelial setae dentate or branched.....Section D, Species 10–19.
2. Mycelial setae curved, falcate or uncinate.....Section E, Species 20–24.
3. Mycelial setae simple, straight.....Section F, Species 25–54.

SECTION A.

Spores 3-septate, Perithecial Setae None, Mycelial Setae Present.

A.—Mycelium forming a compact disc.....1. *M. peltata.*
B.—Mycelium more or less filamentous.
(*a*) Mycelial setae acute at the apex.....2. *M. Scolopiae.*
(*b*) Mycelial setae obtuse at the apex.
1. Setae falcate.....3. *M. campylotricha.*
2. Setae straight or sub-flexuous.
x. Setae 450–600 μ long.....4. *M. Evansii.*
xx. Setae 200–360 μ long.....5. *M. ganglifera.*

1. **Meliola peltata** Doidge.

Trans. Roy. Soc. South Africa 5, p. 727 (1917); Stevens, Ann. Myc. 26, p. 167 (1928).

Group number 2111. 6343.

Amphigenous, forming orbicular, dull black or pilose spots, 1–7 mm. diameter. Mycelium compact, forming a pseudo-parenchymatous disc with a definite margin; hyphae 6–11 μ thick, cells 3–15 μ long; branching flabelliform, the branches being closely appressed to the main hypha. Capitate hyphopodia alternate, fairly numerous, closely appressed to the hyphae, stipitate, sub-clavate, 35–45 μ long; head cell irregular in shape through pressure of surrounding hyphae, usually sub-lobed, 20–30 × 13–20 μ. Mucronate hyphopodia not seen. Mycelial setae few or numerous, straight, simple, quite opaque at the base, less so at the blunt apex, 450–750 μ long, tapering gradually from base to apex. Perithecia rare, black, globose, verrucose, 300–360 μ diameter; cells of perithecial wall convex. Asci not seen. Spores 3-septate, very rarely 2-septate, brown, ellipsoid deeply constricted, 55–70 × 23–27 μ, the majority being 57–60 μ long, the terminal cells being smaller than the medial ones.

Hosts: *Podocarpus Thunbergii* Hook., Knysna Forest, Cape Province, 3.6.12, Pienaar [2436]; Woodville Forest, George, 11.11.17, Doidge [10934].

Podocarpus falcata R. Br., Buccleuch, near Cramond, Natal, 17.7.18, Doidge [11551].

Podocarpus elongata L'Herit., Deepwalls, Knysna, 13.5.23, Doidge [17218].

This species is rare compared with *Irene Podocarpi*, with which it is associated on the same leaves. Perithecia are scarce, and seem to collapse very readily at maturity; only a few have been seen. The perithecia previously described (loc. cit.) were those of a parasite, and are much more frequent than the Meliola perithecia. Spores in all stages of germination are common in the material collected. The systematic position of this fungus is more than a little doubtful, but a more critical study must be deferred until better material is available.

2. **Meliola Scolopiae** Doidge n. sp.

Group number 2111. 5232.

Amphigenous, forming round, velvety black spots up to 5 mm. diameter; often these are numerous and become confluent, thus forming larger irregular blotches. Mycelium

reticulate, composed of straight or somewhat sinuous hyphae, 6–7 μ thick; cells 20–40 μ long; branches opposite or alternate, emerging at an angle of about 45 degrees with the main hypha. Capitate hyphopodia alternate or unilateral, usually one to each cell, 23–37 μ high, straight or sub-uncinate; stipe cell 6–13 μ long; head cell 10–18 μ broad, irregular in form, usually more or less club-shaped and sub-lobed, or with 2–5 irregular, rounded or truncate lobes. Mucronate hyphopodia not very numerous, interspersed with the capitate hyphopodia, opposite or unilateral, slender, lageniform with a curved neck, 20–24 × 6–6·5 μ. Mycelial setae numerous, simple, straight or slightly curved, erect, opaque right up to tip, 300–400 μ long, 7–10 μ thick at the base, and tapering somewhat towards the acute apex. Perithecia in small groups, black, globose, carbonaceous, 200–300 μ diameter; surface cells convex or mammillate. Asci 2–4-spored, evanescent. Spores dark brown, 3-septate, ellipsoid, rounded at both ends, constricted, 53–57 × 16·5–20 μ.

Host: *Scolopia Zeyheri* Warb., Table Mountain, near Pietermaritzburg, Natal, 12.7.21, Doidge [14959]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12277]; Mossel Bay, 22.7.15, Pole Evans [9067]; Pirie Forest, 18.7.27, Doidge [22421].

Differs from *M. Evansii* chiefly in the form of the setae, which are shorter, stouter, and have an acute apex.

3. **Meliola campylotricha** Syd.

Ann. Myc. 22, p. 420 (1924); Stevens, Ann. Myc. 26, p. 167 (1928).

Group number 2111. 5232.

Epiphyllous, forming round spots, which are 2–4 mm. diameter, very black, velvety, and usually not confluent. Mycelium composed of chestnut brown hyphae, 7–9 μ thick, closely interwoven, septate, not torulose or slightly so; cells 25–30 μ long; branches emerging at right angles with the hypha. Capitate hyphopodia fairly numerous, 24–28 μ long; stalk cell rather long; head cell 14–18 μ broad, variously lobed. Mucronate hyphopodia not seen. Mycelial setae very numerous, simple, usually more or less curved or falcate, 250–320 μ long, 8–12 μ thick at the base or in the centre, not tapering towards the obtuse apex or slightly so, opaque right to the apex, septate, black, often uneven in thickness or very slightly inflated. Perithecia fairly numerous, globose, rough, 250–300 μ diameter. Asci 2-spored. Spores oblong-cylindrical, 3-septate, usually slightly constricted, straight or unequal-sided, brown, 52–60 × 18–20 μ; medial cell usually larger.

Host: *Apodytes dimidiata* E. Mey., Woodbush, Transvaal, July 1924, P. A. van der Bijl (van der Bijl 1515).

Not represented in the National Herbarium.

4. **Meliola Evansii** Doidge.

Trans. Roy. Soc. South Africa 8, p. 112 (1920); Stevens, Ann. Myc. 26, p. 168 (1928).

Group number 2111. 5333.

Amphigenous and caulicolous; forming on the twigs irregular, elongated blotches; on the upper leaf surface forming sub-circular, black, carbonaceous spots up to 5 mm. diameter; on the under surface at first round, then becoming more irregular and often spreading along the margin of the leaf. Mycelium reticulate, composed of straight or slightly undulate hyphae, 6–7 μ thick; cells mostly 20–27 μ long; branches alternate, usually emerging at an angle of about 45 degrees with the main hypha. Capitate hyphopodia alternate, usually one to each cell, 24–40 μ high; stipe cell comparatively short, 6–9 μ long, tapering towards the base, occasionally gibbous; head cell 10–17 μ broad, frequently sub-uncinate, more rarely quite straight, irregularly 2–5-lobed; lobes rounded or truncate. Mucronate hyphopodia rare, interspersed with the capitate hyphopodia, narrow-conical, about 16–17 × 6–6·5 μ. Mycelial setae variable in number, often very numerous, scattered, black, opaque except near the apex, 450–600 μ long, 6–8 μ thick at the base, and tapering gradually to a blunt apex. Perithecia not very

numerous, scattered, black, carbonaceous, globose, verrucose, 200–275 μ diameter, surface cells convex. Asci 2–4-spored, evanescent. Spores 3-septate, brown, ellipsoid. straight or slightly curved, rounded at both ends, slightly constricted, 47–57 $\times$ 18·5–25·5 μ,

Hosts: *Cassine eucleaeforme* Kuntze, Woodbush, Northern Transvaal, February 1914 O'Connor (Govt. Herb. [10222]).

Gymnosporia albata L., Kentani, Cape Province, 7.10.14, Pegler [8392 and 8393].

Pterocelastrus tricuspidatus Sond., Quedeni Forest, Zululand, Davis [11237]; Deepwalls, Knysna, 13.5.23, Doidge [17206]; Knysna, 23.2.25, Phillips [20346].

5. **Meliola ganglifera** Kalch.

Trans. Roy. Soc. South Africa 5, p. 727, Pl. 61, Fig. 17; Stevens, Ann. Myc. 26, p. 168 (1928).

Group number 2111. 4232.

Amphigenous, forming round, velvety black spots up to 18 mm. diameter, often confluent and covering much of the leaf surface. Mycelium freely branched and interwoven; branches usually opposite, forming a broad angle with the main hypha; hyphae straight or somewhat sinuous, 6–7 μ thick; cells 20–40 μ long. Capitate hyphopodia alternate, usually one to each cell, stipitate, straight, hooked or uncinate, 27–36 μ long; stipe cell cylindrical or more rarely sub-lobed, up to 10 μ long; head cell up to 20 μ broad, irregularly 3–5-lobed; lobes rounded, truncate or retuse. Mucronate hyphopodia not very numerous, interspersed with the capitate hyphopodia, opposite or alternate, ampulliform, 18–21 $\times$ 7–9 μ, neck straight, curved or oblique. Mycelial setae numerous, black, opaque except near the apex, simple, straight, abruptly bent almost at right angles just above the base, or more or less flexuous, 200–360 μ long, about 8 μ thick near the base, and tapering gradually to the blunt apex. Perithecia fairly numerous, black, globose, verrucose, 150–250 μ diameter; cells of perithecial wall convex. Asci ovoid, briefly pedicellate, 2–4-spored. Spores cylindrical, 3-septate, rounded at both ends, slightly constricted, 45–50 $\times$ 15–18 μ.

Host: *Curtisea faginea* Ait., Woodbush, Northern Transvaal, Burtt Davy [134]; Izelini Forest, Kingwilliamstown, 14.6.15, Emmett [9063]; Kentani, Cape Province, 10.12.15, Pegler [9160]; Hogsback, Victoria East, Cape Province, 12.8.15, van der Bijl [9457]; Woodville Forest, George, February 1918, Sim [11852]; Zwartkop, Natal, 19.7.18, Doidge [11601]; Izelini Forest, Kingwilliamstown, 22.6.18, Doidge [11609]; Woodville Forest, George, 11.11.17, Doidge [10933]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12292]; Howiesons Poort, Grahamstown, 12.7.29, Doidge [12380]; Storms River, Humansdorp Dist., 15.5.23, Doidge [17180]; Deep Walls, Knysna, 13.5.23, Doidge [17213].

SECTION B.

Perithecial Setae Present, no Mycelial Setae.

(*Irenopsis* Stevens, Ann. Myc. XXV, p. 411 1927.)

(*a*) Perithecial setae septate.....6. *M. Bosciae.*

(*b*) Perithecial setae non-septate.

1. Setae uncinate at the tips.....7. *M. claviculata.*
2. Setae incurved, but not uncinate.....8. *M. comata.*

6. **Meliola Bosciae** Doidge.

Trans. Roy. Soc. South Africa 5, p. 731 (1917), Pl. 61, Fig. 26:

Syn. *Meliola kentaniensis* Doidge, Trans. Roy. Soc. South Africa 8, p. 113 (1920), Pl. 5, Fig. 4.

Irenopsis Bosciae (Doidge) Stevens, Ann. Myc. 25, p. 435 (1927).

Group number 3401. 4220.

Amphigenous, mostly epiphyllous, forming round black spots 2–5 mm. diameter, often becoming confluent and covering a large part of the leaf surface. Mycelium radiating,

composed of olive brown hyphae 7–9 μ diameter, straight or sub-flexuous; cells usually 18–24 μ long; branches opposite, usually emerging at an acute angle (ca 45°) with the main hyphae; capitate hyphopodia alternate or unilateral, usually one to each cell, rarely opposite, briefly stipitate, usually closely appressed to the hyphae, 14–20 μ long; stipe cell about 3 μ long and 6 μ broad; head cell 8–10 μ broad, usually ovate, truncate or more or less angular or sub-lobed. Mucronate hyphopodia not numerous, usually found in the neighbourhood of the perithecia, on separate short branches, or more frequently interspersed with the capitate hyphopodia, opposite or unilateral, 14–18 × 6–8 μ, ampulliform, with a rather long curved neck. Mycelial setae none. Perithecia scattered, rather numerous, in the early stages radiating, hemispherical in structure, resembling immature perithecia of *Amazonia* (especially 11373), finally black, globose, verrucose 160–200 μ diameter; outer cells of perithecial wall convex, perithecial setae 5 to 12, scattered, straight, slightly curved abruptly or bent just below the tip, pellucid, dark brown, 60–90 μ long, septate, 5–7 μ thick at the slightly bulbous base, and tapering gradually upwards to the blunt apex. Asci 2–3-spored, ovate, briefly pedicellate, evanescent. Spores dark brown, 4-septate cylindrical, broadly rounded at both ends, constricted, usually 35–47 × 15–20 μ, sometimes narrower (12–14 μ).

Hosts: *Maerua sp.*, (*Niebuhria pedunculata* Hochst.), Winkle Spruit, Natal, 6.7.12, Doidge [2510]; Durban, Natal, 15.6.15, Lansdell [9016]; Umgeni, Natal, 16.7.15, Medley Wood [9024]; Kentani, Cape Province, 6.11.15, Pegler [9539]; Durban, 4.8.17, Van der Bijl [11350]; Durban, 7.4.18, Bottomley [11373]; Umkomaas, Natal, 25.4.19, Bottomley [11880]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12321]; Howiesons Poort, Grahamstown, 12.7.19, Doidge [12389]; East London, 19.7.19, Doidge [12406]; Ebb and Flow, Wilderness, George, 10.5.23, Doidge [17124].

?*Maerua sp.*, Kentani, Cape Province, 6.9.15, Pegler [9130] (type of *M. Kentaniensis*).

Capparis corymbifera E. Mey., Rikatli, Portuguese East Africa, Sept. 1918, Junod [11730].

7. **Meliola claviculata** Doidge.

Trans. Roy. Soc. South Africa 8, p. 113 (1920), Pl. 6, Fig. 5.

Syn. *Irenopsis claviculata* (Doidge) Stevens, Ann. Myc. 25, p. 440 (1927).

Group number 3301. 3230.

Amphigenous, producing minute black spots which are closely crowded on the leaf surface, but not confluent. Hyphae brown, undulating, 6–7 μ thick; cells short 12–15 μ long; branches usually opposite. Capitate hyphopodia alternate, usually one to each cell, briefly stipitate, 17–20 × 8–10 μ, often appressed to the hypha; stipe cell 3–5 μ long; head cell ovate to irregular, rounded or flattened at the apex. Mucronate hyphopodia opposite or unilateral, curved, ampulliform, interspersed with the capitate hyphopodia, 14–20 × 6–7 μ. Mycelial setae none. Perithecia grouped in the centre of the colony, black, globose, verrucose, membranaceous, 200–240 μ diameter; outer cells of perithecial wall convex pellucid. Perithecial setae 3–7, surrounding the false ostiole, pellucid, non-septate, 100–120 × 6–7 μ, not attenuate towards the uncinate or twisted apex. Asci 2-spored evanescent. Spores 4-septate, cylindrical, slightly constricted, rounded at both ends, 35–40 × 15–18 μ; the loculi being somewhat irregular in length and diameter.

Host: *Oncoba sp.*, Quelimane, Portuguese East Africa, 8.9.13, Pole Evans [7388].

8. **Meliola comata** Doidge.

Trans. Roy. Soc. South Africa 8, p. 111 (1920), Pl. 5, Fig. 1; Bothalia 1, pp. 208 and 215 (1924).

Syn. *Meliola Zehneriae* Van der Bijl, Descr. of some South African Fungi II, South African Journ. Sci. 23, pp. 283–284, December (1926).

Irenopsis comata (Doidge) Stevens, Ann. Myc. 25, p. 437 (1927).

Group number 3401. 4230.

Amphigenous, but mostly epiphyllous, forming black spots 1–3 mm. diameter; hyphae fuscous, flexuous, 7–8 μ thick, branches usually opposite, forming an acute angle (ca 45°

with the hypha. Capitate hyphopodia alternate, stipitate, 18–25 μ long; stipe cell 4–6 μ long; head cell ovate or angular, 9–10 μ broad. Mucronate hyphopodia opposite or unilateral, interspersed with the capitate hyphopodia, piriform or ampulliform, neck often curved, 18–20 $\times$ 6–7 μ. Mycelial setae none. Perithecia grouped in the centre of the colony, black, globose, carbonaceous, 200–240 μ diameter, outer cells of perithecial wall convex. Perithecial setae numerous (about 20), 100–150 μ long, non-septate, dark brown and 6μ thick at the base, tapering towards the apex which is paler and about 3 μ thick, often more or less incurved, but not uncinate at the tips. Asci 2-spored, evanescent. Spores brown, cylindrical, 4-septate, slightly constricted tapering slightly towards the rounded ends, 40–45 $\times$ 15–17 μ.

Host: *Pyrenacantha scandens* Planch., Woodville Forest, George, 11.11.17, Doidge [11020]; Deepwalls, Knysna, 13.5.23, Doidge [17203]; Storms River, Humansdorp District, 15.5.23, Doidge [17192].

This species is badly parasitised by the fungus *Trichothyrium dubiosum* Syd. I have examined a co-type specimen of *M. Zehneriae* sent to me by Dr. John Phillips from Knysna; the host is not *Zehneria* but *Pyrenacantha*, and the fungus identical with *M. comata*.

SECTION C.

Both Mycelial and Perithecial Setae Present.

9. **Meliola argentina** Speg.

Ann. Soc. Cient. Argentina 9, p. 177 No. 72 (1880), Stevens, Ann. Myc. 26, p. 172 (1928).

Syn. *Meliola Cyperi* Pat., Gaillard, Le Genre Meliola,p. 70–71.

Amphigenous, forming velvety black spots up to 5 mm. diameter, often confluent. Hyphae sinuous, 7–9 μ thick, cells 14–20 μ long; branches alternate. Capitate hyphopodia alternate, usually one to each cell, stipitate, 15 to 25 μ long; stipe cell usually short, cylindrical; head cell, ovate, cylindrical or variously sub-lobed, 10–26 μ broad, rounded, truncate or retuse at the apex. Mucronate hyphopodia on separate branches, which are more slender (6–7 μ) and paler than those bearing the capitate hyphopodia, opposite, alternate or unilateral, cylindrical or lageniform, 15–20 $\times$ 6–7 μ. Mycelial setae numerous, simple, straight, stout, black 500–900 μ long, 10–15 μ thick and opaque at the base, somewhat attenuate towards the acute apex, which is slightly paler. Perithecia scattered, black, globose, 150–200 μ diameter, verrucose, with 4–6 curved setae round the false ostiole at the apex. Perithecial setae 90–110 $\times$ 6–7 μ, dark brown, acute at the tip. Asci evanescent, 2-spored. Spores elliptic-cylindrical, slightly constricted, rounded at both ends, rather light brown, 40–47 $\times$ 13–17 μ.

Host: *Cladium Jamaicense*, Crantz, on leaves, Knysna, 9.4.15, J. Phillips [20399].

SECTION D.

Spores 4-Septate, Perithecial Setae none, Mycelial Setae Forked or Toothed.

(*a*) Setae denticulate at the tips, but not with spreading branches.
- 1. Capitate hyphopodia opposite.....10. *M. capensis.*
- 2. Capitate hyphopodia alternate.
  - x. Setae not tapering, with 2–5 teeth or incisions on the blunt apex.....11. *M. brachyodonta.*
  - xx. Setae tapering somewhat towards the apex.
    - o. Spores 35–40 μ long.....12. *M. Allophylli.*
    - oo. Spores 40–45 μ long.....13. *M. furcillata.*
    - ooo. Spores 48–55 μ long.....14. *M. palmicola.*

(*b*) Setae with 2 or 3 short, spreading branches less than 20 μ long....15. *M. Behniae.*

(*c*) Setae usually with 2 longer spreading branches, which may be again 2–3-fid—

1. Capitate hyphopodia, mostly opposite.....16. *M. bifida.*
2. Capitate hyphopodia opposite or alternate.
   - x. Primary branches of setae 40–50 μ long.....17. *M. Choristylidis.*
   - xx. Primary branches of setae up to 130 μ long.....18. *M. leptidea.*
3. Capitate hyphopodia alternate.....19. *M. Merrillii.*

10. **Meliola capensis** (Kalch. et Cke.) Theiss.

Ann. Myc. 10, p. 19 (1912), Trans. Roy. Soc. South Africa 5, p. 731, Pl. 62, Fig. 27 ; Bothalia 1, p. 71, Fig. 2, Stevens, Ann. Myc. 26, p. 205 (1928).

Syn. *Asterina capensis* Kalch. et Cke. Grevillia 9, p. 32.

Group number 3132. 3222.

Amphigenous, mostly epiphyllous, forming round, velvety black colonies 2–5 mm. diameter, sometimes confluent and covering large areas. Mycelium radiating ; hyphae straight, brown, 6–8 μ thick, cells 10–15 μ long ; branches opposite, usually forming a wide angle with the hyphae (more than 45°). Capitate hyphopodia opposite, usually 2 to each cell, 12–16 μ long, often almost at right angles to the hypha, cylindrical or ovate, straight or more rarely somewhat curved or bent ; head cell rounded at the apex, 7–9 μ broad ; stipe cell very short, 3–3·5 μ. Mucronate hyphopodia interspersed with the capitate hyphopodia, opposite, fairly numerous, pyriform, 14–18 μ long. Mycelial setae numerous, straight, dark brown, paler near the apex, not opaque, 300–400 μ long, 6–8 μ thick at the base and tapering somewhat towards the apex ; apex simple, acute, or 2–3 dentate, teeth minute or up to 7 μ long (rarely up to 25 μ), teeth occasionally denticulate at the tips. Perithecia in small groups, black, globose, carbonaceous, 120–200 μ diameter, verrucose ; outer cells of perithecial wall convex or conical. Asci 2-spored, evanescent. Spores 4-septate, brown, cylindrical, broadly rounded at both ends, 33–40 × 13–16 μ.

Host : *Hippobromus alata* E. and Z., Durban 1897, Medley Wood [9519] ; Inanda, Natal, Medley Wood [10354] ; Winkle Spruit, Natal, 13.4.11, Pole Evans [1402] ; Winkle Spruit, 6.7.12, Doidge [2499] ; Verulam, Natal, 3.7.13 [6805] ; Tongaat, Natal, 12.9.13, Van der Bijl [6953] ; Kentani, Cape Province, 7.10.17 and 2.2.15, Pegler [8391 and 8849] ; Umgeni, Natal, 16.7.15, Medley Wood [9034] ; Van Stadens Pass, Cape Province, 13.11.17, Doidge [10882] ; Howiesons Poort, Grahamstown, 17.11.17, Doidge [10969] ; Stella Bush, Durban, 23.9.17, Van der Bijl [11355] ; Umkomaas, Natal, 25.4.19, Bottomley [11888] ; Langholm Estates, Bathurst District, Cape Province, 14.7.19, Doidge [12342] ; Howiesons Poort, Grahamstown, 12.7.19, Doidge [12378] ; Stella Bush, Durban, 11.3.21, Shilz [14700] ; Elandshoek, Transvaal, 20.7.22, Bottomley [15525].

11. **Meliola brachyodonta** Syd. n. sp.

Syn. *Meliola geniculata* Syd. et Butl., var. *macrospora* Doidge, in Trans. Roy. Soc. South Africa 8, p. 109, Pl. 4, Fig. 4 (1920).

Group number 3131. 4231

Epiphyllous, forming at first round to irregular, black spots 1–3 mm. diameter, later becoming more or less effuse and ill-defined. Hyphae brown, undulating, 6–8 μ thick ; cells 16 to 36 μ long, the majority being 16–24 μ ; branches usually alternate, making an acute angle with the hyphae (45° or less). Capitate hyphopodia alternate, stipitate, 16–24 μ long ; stipe cell cylindrical 5–10 μ long × 6–8 μ diameter ; head cell ovate, 10–14 μ diameter. Mucronate hyphopodia not numerous, opposite or unilateral up to 25 μ long, ampulliform, neck straight or curved. Mycelial setae numerous, especially round the perithecia, brown, more or less translucent throughout, paler near the apex, 200–300 μ long, 6–8 thick, not tapering towards the apex, abruptly geniculate near the base, with 2–5 incisions or teeth on the blunt apex. Perithecia more or less grouped near the centre of the colony, black, lobose, verrucose, carbonaceous, 180–240 μ diameter, outer cells of perithecial wall convex

or conical. Asci ovate, very briefly pedicellate, 2-spored. Spores brown, 4-septate, oblong or cylindrical, rounded at both ends, slightly constricted, 40–43 × 16–18 μ.

Host: *Rhus tomentosa* Linn., Van Stadens Pass, Cape Province, 13.11.17, Doidge [10879].

12. **Meliola Allophylli** Doidge n. sp.

Group number 3131. 3222.

Amphigenous, forming small, orbicular, dull-black colonies up to 2·5 mm. diameter, often numerous and coalescing to form larger, irregular blotches. Mycelium brown, radiating, consisting of undulating hyphae 6–7 μ thick; branches alternate; cells 15–27 μ long. Capitate hyphopodia alternate, usually one to each cell, 15–25 μ long, usually antrorse but less frequently perpendicular or even retrorse; stalk cell short, 4–10 μ long; cylindrical or gibbous; head cell irregular, clavate, in the form of an inverted triangle or slightly lobed, 10–17 × 6–14 μ. Mucronate hyphopodia not very numerous, pale, delicate, slender ampulliform, 15–20 × 6–7 μ. Mycelial setae rather numerous, scattered, straight, dark brown, more or less translucent throughout, but paler near the apex, 240–400 μ long, 6–7 μ thick at the base and tapering only slightly upwards; apex simple, acute, or bifid, the teeth minute or up to 30 μ long. Perithecia grouped in the centre of the colony, globose, black, carbonaceous, 120–170 μ diameter, surface cells convex. Asci evanescent. Spores 4-septate, cylindrical, broadly rounded at both ends, slightly constricted, brown, 35–40 × 13–17 μ.

Host: *Allophyllus erosus*, Radkl., East London, Cape Province, 19.7.19, Doidge [12404]; Kowie, Cape Province, 11.8.24, Britten [21009].

13. **Meliola furcillata** Doidge.

Trans. Roy. Soc. South Africa 5, p. 736, Pl. 65, Fig. 39 (1917); Trans. Roy. Soc. South Africa 8, p. 139 (1920); Stevens, Ann. Myc. 26, p. 210 (1928).

Group number 3131. 4223.

Amphigenous, forming thin black spots 2–3 mm. diameter. Hyphae straight or somewhat sinuous, olive brown, 6–8 μ thick; cells mostly 15–21 μ long; branches usually opposite. Capitate hyphopodia alternate, usually one to each cell, briefly stipitate, 18–23 μ long, stipe cell short, cylindrical, head cell ovoid or sub-cylindrical 10·5–17 × 7–9 μ. Mucronate hyphopodia fairly numerous, interspersed with the capitate hyphopodia, 14–18 μ long, with a rather long neck which is frequently curved. Mycelial setae rather sparse, more numerous in the neighbourhood of the perithecia, once or twice abruptly geniculate near the base, otherwise straight, very variable in length, 240–900 μ long, 7–8 μ thick, dark brown, semi-translucent at the base, sub-torulose often with a slight constriction just below the apex, tapering gradually towards the slightly paler apex. Apex variously toothed, sometimes a single mucronate point or simply 2–3 dentate, sometimes more irregularly notched or teeth again minutely bi-dentate. Perithecia scattered or in small groups, black, globose, verrucose, 160–180 μ diameter. Asci 2-spored. Spores brown, 4-septate, cylindrical, slightly constricted, broadly rounded at both ends, 40–45 × 16–18 μ.

Hosts: *Allophyllus monophylla* Radkl. (=*Schmidelia monophylla*), Haenertsburg, July 1907 [404]; Amanzimtoti, Natal, 10.7.11, Doidge [1573]; Claridge, Natal, 31.5.15, Doidge [8993]; Buccleuch, near Cramond, Natal, 20.4.16, Sim [10148], same locality 17.7.18, Doidge [11577]; Duncairn, near Pietermaritzburg, 13.7.21, Doidge [14951].

Allophyllus melanacarpa Radkl., Town Bush Valley, Pietermaritzburg, 21.3.16, Doidge [9716].

14. **Meliola Palmicola** Wint.

Hedwigia 26, p. 31, 1887. Stevens, Ann. Myc. 26, p. 210 (1928).

Syn: *Meliola contigua* Karst. et Roum. Rev. Myc. 12, p. 77 (1890).

Group number 3131. 5332.

Amphigenous, but mostly epiphyllous, forming black velvety spots 2–6 mm. diameter; these frequently coalesce and form larger irregular blotches. Mycelium formed of freely-branching, brown hyphae, which are 6·5–8·5 μ thick, straight or slightly sinuous; cells 17–30 μ long; branches opposite. Capitate hyphopodia alternate, usually one to each cell, stipitate, usually at an angle of about 45° with the hypha, 30–35 μ long and 8·5–10 μ broad; stipe cell 8·5–11·5 μ long, straight, somewhat curved or gibbous; head cell sub-clavate or cylindrical, more rarely irregular in form, smooth or sub-lobed. Mucronate hyphopodia not very numerous, interspersed with the capitate hyphopodia, ampulliform, 20–24 × 7–8·5 μ. Mycelial setae very numerous, straight, erect, 300–520 μ long; opaque, black at base and 10 μ thick, tapering gradually to 5–6·5 μ at the more translucent apex; apex symmetrically or asymmetrically 1–4-dentate, teeth 1·5–13 μ long, and occasionally again bidenticulate. Perithecia in groups, concealed amongst the setae, black, globose, verruculose, 220–240 μ diameter. Asci ellipsoid, with a short foot, 4-spored, 56–60 × 30 μ. Spores brown, 4-septate, sub-ellipsoid, slightly constricted, 47–53 × 18–20 μ.

Host: *Phoenix reclinata* Jacq., Port Shepstone, 15.10.12, Pole Evans [5607]; Kentani Cape Province, 29.11.15, Pegler [9170].

15. **Meliola Behniae** Syd. n. sp.

Sub. *Meliola dracaenicola* Pat. et Har., Bothalia 1, p. 72 (1922), Fig. 3.
Group number 3131. 4231.

Amphigenous, black, forming spots 2–5 mm. diameter, easily detachable from the leaf surface. Hyphae brown, straight, 7–9 μ thick; cells 17–20 μ long; branches opposite, numerous, anastomosing. Capitate hyphopodia alternate or unilateral, stipitate, 17–20 × 10–13 μ; stipe cell short, cylindrical, 5–7 μ long; head cell sub-globose. Mucronate hyphopodia numerous, alternate or opposite, interspersed with the capitate hyphopodia, pyriform or ampulliform, with a straight or curved neck, 15–20 × 6–7 μ. Mycelial setae very numerous, stout, erect, abruptly geniculate at the base or taking a broad curve upwards, opaque, 250–350 μ long, 10–11·5 μ thick, dividing near the apex into two or three short spreading branches 10–17 μ long, each of these being usually divided at the apex into two or three small tapering branches 6–10 μ long; occasionally the latter are themselves bidentate. Perithecia not numerous, black, carbonaceous, globose, 250–300 μ diameter. Spores straight, brown, cylindrical, 4-septate, constricted, broadly rounded at both ends, 43–46 × 16 μ.

Host: *Behnia reticulata* F. Didrichs, Woodbush, Northern Transvaal, 3.8.11, Doidge [1779]; Louis Trichardt, Northern Transvaal, 8.4.19, Putterill [11848]; Duncairn, near Pietermaritzburg, 13.7.21, Doidge [14955]; Woodbush, Northern Transvaal, 16.9.23, Doidge [17767].

16. **Meliola bifida** Cke.

Grevillea 9, p. 15 (1880); Emend. Doidge Trans. Roy. Soc. South Africa 5, p. 738 Pl. 66, Fig. 41 (1917); Stevens, Ann. Myc. 26, p. 178 (1928).
Group number 3133. 4232.

Chiefly caulicolous, but also on the leaves, forming conspicuous, black, velvety spots. Mycelium dense brown, very freely branched; branches usually opposite; cells 15–25 μ long. Capitate hyphopodia very numerous, crowded, opposite or alternate, 15–18 μ long; head cell sub-cylindrical to ovate, convex, frequently compressed, 11–14 × 7–8 μ. Mucronate hyphopodia, interspersed with the capitate hyphopodia ampulliform with a curved neck, up to 15 μ long. Mycelial setae very numerous, erect, 250–350 μ long, dark brown but not opaque at base, and 8–10 μ thick; paler near apex, bifid; branches 10–19 μ long, 6–7·5 μ thick, simple or bifid; apices acute, in many cases the ultimate apices are bi- or tri-dentate. Perithecia numerous, completely concealed by the setae, black, globose, verrucose, 250–300 μ diameter. Asci 2–3-spored. Spores brown, 4-septate, cylindrical, rounded at both ends, slightly constricted, 42–50 × 14–16 μ.

Host: *Osyridicarpus natalensis* DC., Springfield, Natal, 14.7.15, Medley Wood [9020]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12326]; Winters Kloof, Natal, 13.9.19, Doidge [12443]; Karkloof, near Pietermaritzburg, 14.7.21, Doidge [14956].

17. **Meliola Choristylidis** Doidge.

Bothalia 2, pp. 236–7, Fig. 4 (1927).
Group number 3143. 3221.

Epiphyllous, colonies round or irregular in outline, black, 4–10 mm. in diameter. Mycelium forming an open network composed of straight, brown hyphae, 6·5–7·5 μ thick; cells 15–40 μ long; branches opposite. Capitate hyphopodia opposite, alternate or unilateral, usually one or a pair to each cell, 14–18 μ long, 8·5–10 μ broad; stipe cell cylindrical, short; head cell smooth, ovate or ovate-oblong. Mucronate hyphopodia abundant in the older parts of the colony, interspersed with capitate hyphopodia, opposite, bottle-shaped or flask-shaped, 14–17 $\times$ 6·5 μ neck, rather thick, straight or slightly curved. Mycelial setae abundant around the perithecia, 200–250 μ high, dark brown, and 6·5–10 μ thick at the base, tapering towards the tips and becoming lighter in colour, once to four times dichotomous, the first branching being 120–150 μ from the base; primary branches at right angles to one another, or more widely divergent; secondary and tertiary branches, when present, usually almost at right angles; primary and secondary branches 40–50 μ long; further branches usually shorter, and ultimate branches often not more than 5–6 μ long. Perithecia scattered, black, globose, 150–175 μ diameter, verrucose; outer cells of perithecial wall rounded or conical, 10–14 μ diameter. Asci 2-spored, evanescent. Spores brown, oblong, 4-septate, broadly rounded at both ends slightly constricted, 36–40 $\times$ 13–15 μ.

Host: *Choristylis rhamnoides* Harv., Woodbush Northern Transvaal, 16.9.23, Doidge [17733].

18. **Meliola leptidea** Syd.

Ann. Myc. 10, p. 38 (1912); Trans. Roy. Soc. South Africa 5, p. 739, Pl. 66, Fig. 42 (1917); Stevens, Ann. Myc. 26, p. 180 (1928).
Group number 3143. 5231.

Epiphyllous, forming velvety black colonies, 2–4 mm. diameter, frequently confluent. Hyphae branched, chestnut brown, 8–11 μ thick; branches opposite, emerging at an acute angle with the main hyphae; cells 10–30 μ long. Capitate hyphopodia very numerous, closely crowded, opposite or alternate, 18–28 μ long; head cell ovate or globose, 10–15 μ thick. Mucronate hyphopodia less numerous, up to 25 μ long. Perithecia grouped in the centre of the colony but not crowded, black, globose, collapsing somewhat when dry, asperulous, 250–300 μ diameter. Mycelial setae very numerous, 200–300 μ long, 8–11 μ thick and opaque at the base, dividing into two long (up to 130 μ) spreading, slightly incurved branches; these branches being again divided into two branches of varying length (30–38 μ), bifurcate at the apex. Asci ovate, 50–60 $\times$ 28–40 μ, 2–3-spored. Spores oblong, broadly rounded at both ends, 4-septate, constricted, chestnut brown, 45–55 $\times$ 15–20 μ.

Host: *Cussonia spicata* Thun., Woodbush, Northern Transvaal, 21.7.07, Legat [405]; Helpmekaar, Woodbush, 3.8.11, Doidge [1774], same locality 16.9.23, Doidge [17759].

19. **Meliola Merrillii** Syd.

Phil. Journ. Sci. C. Bot. 8, p. 479 (1913); Stevens, Ann. Myc. 26, p. 181 (1928).
Syn. *Meliola varia* Doidge, Trans. Roy. Soc. South Africa 5, p. 738, Pl. 65, Fig. 40 (1917).
Group number 3141. 4221.

Amphigenous, but mostly epiphyllous, forming small, velvety black spots 1–8 mm. diameter, later becoming confluent and more or less effuse. Mycelium branching, anastomosing, brown, composed of hyphae 8–10 μ thick; branching irregular. Capitate

hyphopodia alternate, 20–26 μ long ; stipe cell short ; head cell globulose or very slightly lobed, 14–16·5 μ long and 10–14 μ broad. Mucronate hyphopodia rare, opposite, pale, slender ampulliform, up to 24 μ long. Mycelial setae very numerous, 160–220 μ long, 9–11 μ thick at the base, septate, opaque or sub-opaque, above divided into two spreading branches 18–70 μ long and about 8 μ thick ; each of these again bi- or tridentate, or divided into two to three smaller branches, which are again bi- or tridentate at the apex. Perithecia scattered, block, glabose, 140–180 μ diameter. Asci ovate, 2–3-spored. Spores oblong, 4-septate, constricted, brown, broadly rounded at both ends, 40–45 $\times$ 15–17 μ.

Host : *Rhoicissus rhomboidea* E. Mey., Winters Kloof, Natal, 13.7.11, Doidge [1639] ; Town Bush Valley, Pietermaritzburg, 21.3.16, Doidge [9717] ; Buccleuch, near Cramond, Natal, 20.4.16, Sim [10145], 20.7.18, Leighton [11554] ; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12319] ; Woodbush, Northern Transvaal, 17.9.23, Doidge [17730].

SECTION E.

No Perithecial Setae ; Mycelial Setae Uncinate or Falcate.

A.—Apex of setae acute or sub-acute.
- Spores 14–16 μ broad.....20. *M. arcuata.*
- Spores 16–20 μ broad.....21. *M. woodiana.*

B.—Apex of setae obtuse.
- Capitate hyphopodia very rudimentary.....22. *M. cladophila.*
- Capitate hyphopodia well developed—
  - Setae uncinate.....23. *M. petiolaris.*
  - Setae falcate.....24. *M. Cluytiae.*

20. **Meliola arcuata** Doidge.

Trans. Roy. Soc. South Africa 5, p. 737, Pl. 66, Fig. 37 (1917) ; Stevens, Ann. Myc. 26, p. 217 (1928).

Group number 3121. 5222.

On the cladodes forms small velvety black, round-irregular colonies, 1–2 mm. diameter. Mycelium dense, composed of brown hyphae, which are straight or sinuous, 10–11 μ thick, and with short articulations ; cells 10–20 μ long ; branches usually opposite. Capitate hyphopodia alternate, usually one to each cell, briefly stipitate, 20–30 $\times$ 10–14 μ ; head cell irregularly ovate or oblong, dentate or sub-lobed, straight or curved, often appressed to the hypha. Mucronate hyphopodia not numerous, opposite, ampulliform, 13–20 $\times$ 7–10 μ. Mycelial setae numerous, simple, arcuate, flexuous or more rarely almost straight, black, opaque except near the apex, 250–350 μ long and of uneven thickness (7–11 μ) ; apex acute. Perithecia hidden amongst the mycelial setae, black, globose, carbonaceous, minutely verrucose, 120–150 μ diameter. Asci 2-spored, evanescent. Spores ellipsoid-oblong, rounded at both ends, 4-septate, slightly constricted, 50–54 $\times$ 14–16 μ.

Host : *Viscum anceps* E. Mey., on cladodes, Kentani, 1.6.12 and 4.8.14, Pegler [2364 and 8389].

21. **Meliola woodiana** Sacc.

Hedwigia 38, p. 132 (1899), Trans. Roy. Soc. South Africa 5, p. 737, Pl. 64, Fig. 38 (1917). Stevens, Ann. Myc. 26, p. 258 (1928).

Syn. *Meliola falcata* Syd., Ann. Myc. 10, p. 37 (1912) ; Trans. Roy. Soc. South Africa 5, p, 736, Pl. 66, Fig. 36 (1917).

Group number 3121. 5222.

Amphigenous, but most frequently epiphyllous, forming velvety black, orbicular colonies 2–4 mm. diameter, often confluent and then forming larger, irregular blotches. Mycelium radiating, consisting of straight or sub-sinuous hyphae 6–8 μ thick ; cells 18–30 μ long, branches opposite. Capitate hyphopodia alternate, usually one to each cell, 22–30 μ long, stipe cell tapering towards the base, head cell 7–11 μ broad, ovate or slightly angular.

Mucronate hyphopodia on separate short branches, not numerous 11–18 μ long, ampulliform, with a rather short, thick neck. Mycelial setae very numerous, simple, curved, often falcate 175–400 μ long, opaque and 7–9 μ thick at the base, tapering gradually to the more translucent apex; apex acute or sub-acute. Perithecia hidden amongst the numerous mycelial setae, black, globose, verrucose, 200–230 μ diameter. Asci 2–4 spored. Spores oblong, brown, rounded at both ends, 4-septate, constricted, 38–54 × 16–20 μ.

Hosts: *Plectronia ventosa* Linn. Durban, Natal, Medley Wood 6467 [9508] (=type of *M. Woodiana* ?); Amanzimtoti, Natal, 10.7.11, Doidge [1577] (=type of *M. falcata*); Durban, 2.7.11, Pole Evans [1591]; Tongaat, Natal, 12.9.13, Van der Bijl [6952]; Winkle Spruit, Natal, 28.5.15, Doidge [9005]; Springfield, Natal, 14.7.15, Medley Wood [9017]; Kentani, Cape Province, 7.6.15, Pegler [9128]; Van Stadens Pass, Cape Province, 13.11.17, Doidge [10881]; East London, 24.11.17, Doidge [10920]; Durban, 11.8.17, Van der Bijl [11359]; Stella Bush, 19.7.18, Bottomley [11383]; Durban, Bottomley [11385]; Umkomaas, Natal, 25.4.19, Bottomley [11882 and 11890]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12290]; Keurkloof Forest, George, 9.5.23, Doidge [17110]; Deepwalls, Knysna, 13.5.23, Doidge [17219]; Van Stadens Pass, 19.5.23, Doidge [17257].

Plectronia Mundtiana Pappe., Umkomaas, Natal, 25.4.19, Bottomley [11883].

Plectronia spinosa Klotsch., Mayville, Natal, 23.7.15, Medley Wood [9030]; Woodville Forest, George, 11.11.17, Doidge [10956]; Grahamstown, June 1919, Britten [12189]; Howiesons Poort, Grahamstown, 12.7.19, Doidge [12390]; Keurkloof Forest, George, 9.5.23, Doidge [17119].

Plectronia ciliata Sond., Woodville Forest, George, 11.11.17, Doidge [10936].

Medley Wood's specimen which is labelled *Meliola Woodiana* Sacc. (Wood [6467], Colonial Herbarium [7771]) Nat. Herb. [9508], is apparently the type of this species. Unfortunately Wood's number is not quoted in Hedwigia, but there seems to be no doubt whatever that the host is *Plectronia ventosa*.

There is no essential difference between the above specimen (which is badly parasitised) and *M. falcata*. The spores are slightly larger than those of the type of *M. falcata*, but the size of the spores varies in different collections and spores of a length of at least 50 μ are not uncommon.

This is a very conspicuous species and occurs commonly.

22. **Meliola cladophila** Syd.

Ann. Myc. 22, p. 421 (1924). Stevens, Ann. Myc. 26, p. 214 (1928).
Group number 3121. 4242.

Ramicolous, forming extremely velvety, dense black spots 2–8 mm. long. Mycelium consisting of very densely interwoven hyphae with numerous short branches; hyphae variable, chestnut brown, short or very short, 6–9 μ thick, septate, nodulose. Hyphopodia few, rudimentary. Mycelial setae very numerous, simple, almost always more or less curved, falcate or S-shaped, rarely almost straight, 300–350 μ long, 11–16 μ thick, very black over the whole surface, or slightly paler just at the apex, tapering slightly, but often on the contrary slightly thickened at the apex, always broadly rounded. Perithecia fairly numerous, almost entirely hidden among the setae, globose, smooth, 275–325 μ diameter. Asci 2–3-spored. Spores oblong, straight or slightly curved, usually tapering slightly towards both ends, but obtuse at the apices, brown, 4-septate, more or less constricted, 42–47 × 17–20 μ; cells often unequal, medial cell almost always larger, chiefly in the breadth.

Host: *Apodytes dimidiata* E. Mey., on branches, Woodbush, Transvaal, July 1924, leg. Van der Bijl (Van der Bijl [1661]).

Not represented in the National Herbarium.

23. **Meliola petiolaris** Doidge.

Trans. Roy. Soc. South Africa 8, p. 142, Pl. 8, Fig. 7 (1920). Stevens, Ann. Myc. 26, p. 216 (1928).

Group number 3121. 4231.

Hypophyllous, along leaf margins and veins and on petioles, occasionally also on the twigs ; on the leaves forming round or elongated black spots up to 7 mm. diameter or 12 × 6 μ ; on the petioles forming a dense black mat which readily separates from the substratum. Hyphae brown, 5–6·5 μ diameter, almost straight, cells 25–30 μ long, branches opposite or alternate. Capitate hyphopodia alternate or unilateral, very variable in length, slender, 15–40 μ long and 10–13 μ broad ; stipe 1–2-celled, 6–20 μ long, cylindrical or tapering towards the base ; head cell obovate, flattened or sub-lobed, straight or curved. Mucronate hyphopodia not seen. Mycelial setae very numerous, especially on the petioles, forming a dense mat in which the perithecia are concealed, less numerous on the lamina, simple, uncinate, opaque, 150–250 μ long, 8–9 μ thick at the base and tapering somewhat towards the blunt apex. Perithecia numerous, black, globose, carbonaceous, 200–250 μ diameter, minutely verrucose. Asci 2-spored, evanescent. Spores 4-septate, cylindrical, rounded at both ends, slightly constricted, 40–44 × 13–16 μ, the middle cell usually slightly longer than the lateral ones.

Hosts : *Olea laurifolia* Lam., Buccleuch, near Cramond, Natal, 17.7.18, Doidge [11558]. *Olea capensis* Linn., Storms River, Humansdorp District, 15.5.23, Doidge [17173A].

24. **Meliola Cluytiae** Van der Bijl.

South African Journ. Sci. 23, p. 283 (1926).

Group number 3121. 5222.

Colonies mostly epiphyllous, black, orbicular 1 to 2 mm. diameter. Mycelium radiating ; hyphae dark brown, 10–12 μ diameter, individual cells 12–28 μ long, branching opposite. Capitate hyphopodia alternate, pedicellate, 28 μ long ; head cell globose 12 μ × 12–16 μ. Mucronate hyphopodia 12 μ long, 8–11 μ diameter at base and narrowing suddenly near the apex into a neck 4 μ in diameter. Mycelial setae abundant, falcate, 340–400 μ long, 9–12 μ diameter at the base, tapering gradually to 4 μ at the apex ; apex obtuse. Perithecia globose, black, 166 μ diameter. Spores 4-septate, cylindrical, constricted, rounded at both ends, 44–52 × 12–16 μ.

Host : *Cluytia pulchella* Linn., Knysna, Cape Province, Van der Bijl 2317.

This species is not represented in the National Herbarium, and as no specimen has been available for study the original description is quoted.

SECTION F.

No Perithecial Setae, Mycelial Setae Simple and Straight.

A.—Capitate hyphopodia usually opposite.

(*a*) Apex of setae acute.

1. Spores 45–50 × 20–23 μ.....15. *M. Toddaliae.*
2. Spores 40–45 × 16–20 μ.....26. *M. Azimae.*

(*b*) Apex setae blunt or acuminate.

1. Spores 50–60 × 16–20 μ.....27. *M. gemellipoda.*
2. Spores 44–50 × 16–18·5 μ.....28. *M. transvaalensis.*

B.—Capitate hyphopodia opposite, alternate or unilateral.

(*a*) Spores 30–40 μ long.

1. Hyphae sinuous ; head cell of capitate hyphopodia globose.....29. *M. Indigoferae.*
2. Hyphae straight, head cell cylindrical, often curved..30. *M. Ochnae.*

(*b*) Spores 40–50 μ long.

1. Apex of setae acute.....31. *M. rigida.*
2. Apex of setae blunt.....32. *M. buxicola.*

C.—Capitate hyphopodia usually alternate.

(*a*) Capitate hyphopodia more or less lobed or hooked.

1. Apex of setae acute.

o. Spores 35–40 μ long.....33. *M. Excoecariae.*

oo. Spores 40–50 μ long.....

x. Branches opposite, capitate hyphopodia mostly entire and uncinate.....34. *M. Cnestidis.*

xx. Branches alternate, capitate hyphopodia usually sub-lobed.

.. Mycelial setae numerous, scattered.35. *M. rhoina.*

... Mycelial setae not numerous, grouped round perithecia.....36. *M. microthecia.*

ooo. Spores 48–55 μ long, branches opposite, rectangular.....37. *M. sinuosa.*

2. Apex of setae blunt or acuminate.

o. Spores 40–50 μ long.

x. Branches usually opposite.

.. Capitate hyphopodia 16–20 μ long.38. *M. Panici.*

... Capitate hyphopodia 18–30 μ. long.39. *M. Carissae.*

xx. Branches alternate or irregular.

... Spores 17–20 μ broad.....40. *M. Loxostylidis.*

oo. Spores 50–70 μ long.

x. Surface cells of perithecia convex.....41. *M. Cryptocaryae.*

xx. Surface cells very large, mammillate.....42. *M. torta.*

(*b*) Capitate hyphopodia not lobed.

1. Apex of setae acute.

o. Spores 35–45 μ long.....43. *M. Doidgeae.*

oo. Spores 45–50 μ long.....44. *M. oleicola.*

ooo. Spores 50–60 μ long.....45. *M. polytricha.*

2. Apex of setae blunt or acuminate.

o. Spores 25–35 μ long.....46. *M. Psychotriae.*

oo. Spores 35–40 μ. long.

x. Head cell of capitate hyphopodia globose.47. *M. Popowaie.*

xx. Head cell cylindrical.....48. *M. dactylipoda.*

ooo. Spores 40–50 μ long.

x. Capitate hyphopodia 12–16 μ long.....49. *M. cylindripoda.*

xx. Capitate hyphopodia 20–35 μ long

.. Capitate hyphopodia 13–17 μ broad.50. *M. Knowltoniae.*

.. Capitate hyphopodia 7–12 μ broad.

/· Immature perithecia radiating in structure.....51. *M. Goniomae.*

//. Immature perithecia not radiating.

$. Hyphae 6–8 μ thick...52. *M. Osyridis.*

$$. Hyphae 8–10 μ thick..53. *M. littoralis.*

25. **Meliola Toddaliae** Doidge.

Trans. Roy. Soc. South Africa 5, p. 732, Pl. 63, Fig. 28 (1916); Bothalia 1, p. 209 (1924); Stevens, Ann. Myc. 26, p. 230 (1927).

Group number 3112. 4332.

Amphigenous, forming black, circular velvety spots 2–5 mm. diameter, very easily detached from the leaf. Mycelium rather dense, formed of fuscous hyphae 7–10 μ thick; cells 10–20 μ long; branches usually opposite, occasionally unilateral, anastomosing, usually very pale near the tips. Capitate hyphopodia opposite, crowded, usually two to each cell, stipitate, 16–20 μ long; stipe cell cylindrical, 3–7 μ long and about 7 μ thick;

head cell sub-ovate or cylindrical, straight or somewhat curved, rounded at the apex, or flattened in various directions by contact with other hyphopodia, 14–16 μ long and 8–10 μ thick. Mucronate hyphopodia not numerous, opposite, ampulliform, with a short thick neck, which is usually more or less curved, 18–20 × 8–10 μ. Mycelial setae very numerous, simple, straight, erect, opaque at the base, slightly translucent near the apex, 300–350 μ long, 8–10 μ thick at the base, and tapering only slightly upwards; apex acute or acuminate; There are often more or less pronounced constrictions in the setae, particularly near the apex, which at times give it an almost torulose appearance. Perithecia rather numerous, scattered, hidden among the setae, black, globose, verrucose, 200–250 μ diameter, outer cells of perithecial wall rounded or conical, and up to 15 μ diameter. Asci 3–4-spored. Spores 4-septate, cylindrical or somewhat ellipsoid, rounded at both ends, slightly constricted, 45–50 × 20–23 μ, usually broader at the middle than at the ends.

Hosts: *Vepris lanceolata* G. Don. (=*Toddalia lanceolata* Lamk.), Kentani, Cape Province, 17.12.14, Pegler [8788]; Henley, Natal, 24.5.15, Doidge [8999]; Van Stadens Pass, Cape Province, 13.11.17, Doidge [10860]; Stella Bush, Durban, 23.9.17, van der Bijl [11353], Stella Bush 19.4.18, Bottomley [11374]; Buccleuch, Natal, 17.7.18, Doidge [11564]; Louis Trichardt, Northern Transvaal, 8.4.19, Putterill [118427]; Umkomaas, Natal, 25.4.19, Bottomley [11881]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12324]; East London, 19.7.19, Doidge [12418]; Karkloof, near Pietermaritzburg, 14.7.21, Doidge [14954]; Wilderness, George, 10.5.23, Doidge [17113]; Van Stadens Pass, 19.5.23, Doidge [17260].

Teclea natalensis Engl. (=*Toddalia natalensis* Sond.), Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12287].

Fagara capensis Thun. (=*Xanthoxylon capense* Harv.), Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12275]; Winters Kloof, Natal, 13.9.19, Doidge [12440]; Haenertsburg, 14.9.23, Doidge [17774].

Fagara Davyi Verdoorn, Knysna, Cape Province, February 1922, Keet [15531].

26. **Meliola Azimae** Doidge n. sp.
Group number 3112. 4233.

Amphigenous and caulicolous, but mostly epiphyllous; spots sub-circular, black, scattered, up to 3 mm. diameter, often becoming confluent and thus forming larger irregular blotches. Mycelium rather dense, formed of almost straight, fuscous hyphae, 7–10 μ thick, often slightly constricted at the septa; cells 20–35 μ long; branches opposite. Capitate hyphopodia usually opposite, but alternate or unilateral hyphopodia are not infrequent, 16–24 μ high and 6–7 μ thick, straight or somewhat curved or hooked; stipe cell short, cylindrical; head cell usually cylindrical, with truncate or rounded apex, but sometimes more or less club-shaped or hooked. Mucronate hyphopodia not numerous, interspersed with the capitate hyphopodia, 15–18 × 6–7 μ, broadly ampulliform, with a short neck. Mycelial setae rather numerous, simple and straight, black, opaque almost to the tip, very variable in length, 240–640 μ long, 10–12 μ thick at the base, and tapering slightly near the acute apex. Perithecia fairly numerous, grouped in the centre of the spot, black, globose, carbonaceous, 160–250 μ diameter; surface cells slightly convex, collapsing at maturity. Asci 2–3-spored, evanescent. Spores dark brown, 4-septate, cylindrical, broadly rounded at both ends, slightly constricted, 43–50 × 16·5–20 μ.

Host: *Azima tetracantha* Lam., East London, Cape Province, 23.7.27, Doidge [22387].

Very closely related to *M. rigida*, from which it differs slightly but distinctly in the form of the hyphopodia.

27. **Meliola gemellipoda** Doidge.

Bothalia 1, p. 80 (1922); Stevens, Ann. Myc. 26, p. 229 (1928).
Group number 3112. 5233.

Epiphyllous, forming round, black velvety spots 1–5 mm. diameter. Mycelium compact, fairly dense, formed of straight or slightly wavy hyphae, 7–10 μ thick; cells 20–30 μ long, branching opposite or irregular. Capitate hyphopodia opposite, usually two to each cell of the hypha, 16–23 × 9–10 μ; stipe cell short, cylindrical, 3–5 μ long; head cell cylindrical or sub-ovate, rounded at the apex. Mucronate hyphopodia rare, interspersed with the capitate hyphopodia, ampulliform, 20–30 μ long × 10 μ thick at the base. Mycelial setae fairly numerous, simple, straight, black, opaque except near the apex, 360–600 μ long, 9–10 μ thick at the base, and tapering gradually towards the apex, which is rather blunt or acuminate. Perithecia 200–250 μ diameter, black, globose, rather rough but not conspicuously verrucose. Asci 2–3-spored, evanescent. Spores 4-septate, cylindrical, or tapering slightly towards both ends, sometimes slightly asymmetrical and broader at one end than the other, rounded at both ends, slightly constricted, 50–60 × 16–20 μ.

Host: *Jasminum angulare* Vahl., Langholm Estates, Bathurst Dist., Cape Province, 14.7.19, Doidge [12352].

Closely related to *M. Toddaliae*; the spores are longer and narrower in proportion, and the setae more tapering, with less acute apex.

28. **Meliola transvaalensis** Doidge.

Bothalia 2, p. 152 (1927).

Group number 3112. 4233.

Amphigenous, forming black spots 2–5 mm. diameter; mycelium dark brown, dense; hyphae 7–10 μ thick; cells 16–20 μ long; branches usually opposite. Capitate hyphopodia opposite, crowded, usually 2 to each cell, at right angles to or appressed toward the hyphae, 15–20 μ long; stipe cell cylindrical, very short, 3–5 μ long; head cell ovate or flattened by contact, 10–13 μ broad. Mucronate hyphopodia rare, ampulliform, with a curved neck, 16–23 × 6–7 μ. Mycelial setae black, opaque, simple, mostly grouped in the neighbourhood of the perithecia, 450–650 μ long, 10 μ thick at the base, and tapering gradually to a blunt apex. Perithecia crowded in the centre of the colony, black, carbonaceous, globose, 250–290 μ diameter, cells of the outer wall rounded or conical. Asci not seen. Spores oblong, 4-septate, broadly rounded at both ends, very slightly constricted, 44–50 × 16–18·5 μ.

Host: *Myrsine africana* Linn., Woodbush, Zoutpansberg Dist., 16.9.23, Doidge [17746].

Parasitised by *Spegazzinia sp.*

29. **Meliola Indigofera** Syd. n. sp.

Sub. *M. Malacotricha* Speg., Trans. Roy. Soc. South Africa 8, p. 108, Pl. 4, Fig. 1 (1920); Stevens, Ann. Myc. 26, p. 227 (1928).

Group number 3113. 4231.

Mostly hypophyllous, forming round or irregular spots 1–4 mm. diameter, often confluent and covering a great part of the leaf surface. Hyphae sinuous, brown, 5–7 μ thick, composed of cells 25–30 μ long; branches opposite; capitate hyphopodia opposite, alternate or unilateral, 14–16 × 7–10 μ, briefly stipitate; terminal cell ovoid or globular; mucronate hyphopodia interspersed with the capitate hyphopodia, opposite, narrow-ampulliform, 12–15 μ long. Mycelial setae fairly numerous, incurved, and bent at right angles at the base or at some other point in their length, becoming insensibly narrower towards the acute translucent apex, 150–300 × 5–10 μ. Perithecia in small groups in the centre of the spot, globular, then depressed, black, minutely verrucose, 150–220 μ diameter. Asci 2-spored. Spores 4-septate, cylindrical, straight or slightly curved, slightly constricted at the septa, and slightly attenuated towards the rounded extremities, 30–38 × 12–15 μ. Spores occasionally up to 42 μ long.

Hosts: *Indigofera natalensis* Bolus, Buccleuch, Natal, 23.3.16 and 17.7.18, Doidge [9703 and 11560], same locality 20.4.16, Sim [10144].

Baphia racemosa Hochst., Sea View, Durban, 1.10.17, van der Bijl [11354].

30. **Meliola Ochnae** Doidge.

Trans. Roy. Soc. South Africa 8, p. 141, Pl. 8, Fig. 6 (1920); Stevens, Ann. Myc. 26, p. 277 (1928).

Group number 3113. 3222.

Amphigenous, forming irregular spots 4–8 mm. diameter; hyphae fuscous, nearly straight, 5–6 μ thick; cells usually 20–25 μ long; branches opposite or irregular. Capitate hyphopodia alternate, opposite or unilateral, 12–16 × 6–7 μ, briefly stipitate; head cell cylindrical or ovate, often uncinate, rounded at the apex. Mucronate hyphopodia interspersed with the capitate hyphopodia, opposite or scattered, ampulliform; neck straight, oblique or curved, and about equal in length to the base, 15–20 × 6 μ. Mycelial setae not numerous except near the perithecia, simple, straight or flexuous, often sub-crenulate, especially near the tip, 240–350 μ long, translucent throughout, 6–7 μ thick at the ba e and tapering gradually to the apex, which may be blunt or acute. Perithecia not numerous, scattered, black, globose, membranous verrucose, 140–180 μ diameter; superficial cells strongly convex or irregularly conical. Asci evanescent. Spores 4-septate, brown, ellipsoid, rounded at both ends, constricted, 35–37 × 12–15 μ.

Hosts: *Ochna natalitia* Engl. et Gilg., Winter's Kloof, Natal, 1.6.15, Doidge [8989]: Buccleuch Natal, 20.4.16, Sim [10143]; Buccleuch, 17.7.18, Doidge [11567].

Ochna O'Connorii Phillips, Woodbush, Northern Transvaal, 18.9.23, Doidge [17742].

This species is not plentiful on the host and is often parasitised.

31. **Meliola rigida** Doidge.

Trans. Roy. Soc. South Africa 5, p. 736, Pl. 64, Fig. 35 (1916). Stevens, Ann. Myc. 26, p. 230 (1928).

Group number 3113. 4233.

Amphigenous, forming rusty black spots of varying size, hyphae rigid, brown 7–9 μ thick, composed of cells 18–25 μ long; branches opposite, usually at right angles to the hypha. Capitate hyphopodia mostly opposite, but sometimes unilateral or alternate or mostly alternate or unilateral, 14–23 μ long; stipe cell cylindrical, very short, 3–5 μ long; head cell sub-globose, ovate or cylindrical, 8–10 μ broad. Mucronate hyphopodia not very numerous, opposite, paler, 18 μ long, narrowed above into a short neck. Mycelial setae fairly numerous, black, opaque almost to the acute apex, straight, simple, 250–750 μ long, 10–11 μ thick at the base. Perithecia scattered, black, globose, not conspicuously verrucose, 180–220 μ diameter; superficial cells slightly convex. Asci ovate, briefly stipitate, 2–3-spored. Spores brown, 4-septate oblong, broadly rounded at both ends, constricted, 40–45 × 16–20 μ.

Host: *Xymalos monospora* Paill., Winters Kloof, Natal, 27.6.11, Doidge [1667]; Woodbush, Northern Transvaal, 3.8.11, Doidge [1775]; Tabankulu, Transkei, 15.3.15, Fraser [8890]; Buccleuch, Natal, 18.3.15, Pole Evans [8894]; Winters Kloof, Natal, 1.6.15, Doidge [8988]; Buccleuch, Natal, 17.7.18, Doidge [11578]; Zwartkop, near Pietermaritzburg, 19.7.18, Doidge [11599]; Rikatli, Portuguese East Africa, Junod [11614]; Louis Trichardt, Northern Transvaal, 8.4.19, Putterill [11841]; Winters Kloof, Natal, 13.9.19, Doidge [12444]; Haenertsburg, 14.9.23, Doidge [17720].

The material is nearly all very poor and parasitised. In some localities it is associated with *Trichopeltula* sp. In some collections, alternate or unilateral hyphopodia preponderate, and in these colonies the length of the hyphopodia is somewhat greater than in those where they are opposite.

32. **Meliola buxicola** Doidge n. sp.

Group number 3113. 4332.

Amphigenous, but mostly epiphyllous, forming sub-circular, black velvety spots up to 5 mm. diameter. Mycelium radiating, composed of almost straight, brown hyphae 6·5–8 μ thick; cells 13–20 μ long; branches opposite. Capitate hyphopodia opposite

alternate or unilateral, one or two to each cell, 15–20 μ high or occasionally up to 24 μ; stipe cell short, cylindrical; head cell sub-globose or less frequently clavate-cylindrical about 10 μ diameter. Mucronate hyphopodia not numerous, interspersed with the capitate hyphopodia, opposite or solitary 15–18 $\times$ 6–8 μ, ampulliform with a straight or curved neck. Mycelial setae numerous, simple, straight, 200–350 μ long, 7–9 μ thick and opaque at the base, and tapering gradually to the blunt, translucent apex. Perithecia fairly numerous, scattered, black, globose, carbonaceous, 200–250 μ diameter, collapsing at maturity, surface cells convex to conical. Asci evanescent, not seen. Spores brown, 4-septate, cylindrical or sub-ellipsoid broadly rounded at both ends, slightly constricted, 43–47 $\times$ 16·5–22 μ.

Host: *Buxus MacOwani* Oliv., East London, 23.7.27, Doidge [22388].

33. **Meliola Excoecariae** Doidge.

Trans. Roy. Soc. South Africa 8, p. 139, Pl. 7, Fig. 3 (1920). Stevens, Ann. Myc. 26, p. 284 (1928).

Group number 3111. 3222.

Amphigenous, forming round or irregular spots 5–10 μ diameter; hyphae fuscous, gently undulating, 6–8 μ thick; branches usually alternate; cells varying in length, 15–40 μ. Capitate hyphopodia alternate, stipitate, usually one to each cell, 23–35 $\times$ 10–16 μ; stipe cell 7–10 μ long, tapering somewhat towards the base, occasionally sub-lobed; head cell variously lobed, usually obtusely 3-lobed or triangular, lobes truncate, retuse or rounded. Mucronate hyphopodia interspersed with the capitate hyphopodia, opposite or scattered, slender ampulliform or pyriform, 15–20 $\times$ 6–7 μ. Mycelial setae not numerous, 300–500 μ long, opaque and 6–7 thick at the base, not tapering, apex acute, somewhat translucent. Perithecia black, globose, carbonaceous, 145–170 μ diameter (?mature). Asci evanescent. Spores 4-septate, cylindrical, rounded at both ends, very slightly constricted, 35–40 $\times$ 13–17 μ.

Host: *Sapium Simii* O. Kuntze (=*Excoecaria caffra* Sim), Buccleuch, Natal, 17.7.18, Doidge [11566].

The material is badly parasitised, and only small colonies can be found which are free from parasites.

34. **Meliola Cnestidis** Doidge n. sp.

Group number 3111. 4222.

Amphigenous, forming round to irregular black spots up to 5 mm. diameter; mycelium rather dense, composed of closely interwoven hyphae. Hyphae fuscous, conspicuously undulating, 6–8 μ thick, branches usually opposite and at right angles to the hypha; cells 20–30 μ long. Capitate hyphopodia alternate or unilateral, occasionally opposite, usually one to each cell, 18–30 μ long, stipe 5–16 μ long, occasionally septate, usually cylindrical, but sometimes become gradually narrower from the base upwards; head cell 6–16 μ broad, usually entire and incurved, recurved or hooked, less frequently straight and forming an inverted triangle or sub-lobed. Mucronate hyphopodia not numerous, interspersed with the capitate hyphopodia, ampulliform, with a straight or curved neck, 16–20 $\times$ 6–7 μ. Mycelial setae fairly numerous, especially in the neighbourhood of the perithecia, simple, straight, black, opaque except near the tip which is more or less translucent 250–350 μ long, 7–8 μ thick at the base, not tapering or very slightly so, apex acute. Perithecia scattered, black, globose, carbonaceous, 150–200 μ diameter, minutely verrucose. Asci 2–3-spored evanescent. Spores oblong to cylindrical, dark brown, 4-septate, rounded at both ends, slightly constricted, 42–47 $\times$ 15–17 μ.

Host: *Cnestis natalensis* Planch and Sond., Kentani, Cape Province, 10.12.15 and 10.4.15, Pegler [9076 and 9527]; Springfield, Natal, 16.7.15, Medley Wood [9035].

35. **Meliola rhoina** Doidge.

Sub. *Meliola Rhois* P. Henn., Trans. Roy. Soc. South Africa 5, p. 733, Pl. 63, Fig. 31 (1917). Stevens, Ann. Myc. 26, p. 284 (1928).

Group number 3111. 4232.

Amphigenous, forming small, black, velvety spots 1–3 mm. diameter, these are frequently numerous and confluent, covering the greater part of the leaf surface. Mycelium radiating, rather dense, hyphae brown, 7–10 μ thick, more or less undulating, and occasionally sub-torulose ; branching alternate or irregular, branches forming an acute angle with the main hyphae ; cells usually 17–30 μ long. Capitate hyphopodia alternate, usually one to each cell, straight or curved 18–33 μ long ; stipe cell cylindrical or tapering somewhat towards the base, 6–10 μ long ; head cell very variable in form, 10–15 μ broad, more or less ovate, usually sub-lobed, rounded or truncate at the apex. Mucronate hyphopodia not very numerous on separate branches, paler, opposite, ampulliform with a thin neck, 18–22 × 8–10 μ. Mycelial setae rather numerous, scattered, erect, simple, straight, opaque at the base, more translucent near the apex, 280–400 μ long, 7–9 μ thick at the base, not tapering or very slightly so, apex acute (apex very rarely bi-furcate, only 3 have been seen on different slides, with bi-furcate tips). Perithecia scattered or in groups, black, globose, verrucose 180–240 μ diameter. Asci elliptic-ovate with a very short foot, 2–4-spored. Spores 4-septate, cylindrical, broadly rounded at both ends, slightly constricted, 43–50 × 16–18 μ.

Hosts: *Rhus crenata* Thun., Verulam, Natal, 3.7.13, Pole Evans [6804] ; Mayville, Natal, 22.7.15, Medley Wood [9032].

Rhus Guienzii Sond., East London, 19.7.19, Doidge [12428].

Rhus longispina E. and Z., Despatch, near Uitenhage, 24.3.11, Doidge [1239] ; Langholm Estates, Bathurst District, 14.7.19, Doidge [12348] ; Kowie, Cape Province, 15.7.19, Doidge [12360] ; Port Alfred, 26.9.19, Britten [14216] ; Kowie River Bush, Cape Province, 30.9.19 Britten [14217].

Rhus refracta E. and Z., Langholm Estates, Bathurst District, 14.7.19, Doidge [12371]; Kowie, Cape Province, 9.11.19, Britten [14220] ; Van Stadens Pass, Cape Province, 19.5.23 Doidge [17250].

Rhus villosa Linn. fil., Stella Bush, Durban, 2.7.12, Doidge [2519] ; Buccleuch, near Cramond, Natal, 17.7.18, Doidge [11590] ; Umkomaas, Natal, 25.4.19, Bottomley [11892].

No. 2519 on *Rhus villosa* was described as var. *tenuis*, but this cannot be separated from the species, which is very variable in habit.

36. **Meliola microthecia** Thuem.

Flora 1876, p. 569 ; Gaill., Le Genre Meliola, p. 73, Trans. Roy. Soc. South Africa 5, p. 734, Pl. 64, Fig. 32 (1917).

Syn. *Meliola thuemeniana* Stevens, Ann. Myc. 26, pp. 259 and 295 (1928).

Group number 3111. 4232.

Amphigenous, forming very small thin colonies ·5 to 1·5 mm. diameter. Mycelium radiating, dark brown. Hyphae undulating, 7–8 μ thick, cells 15–20 μ long, branches alternate. Capitate hyphopodia alternate, usually one to each cell, stipitate, 20–30 × 10–18 μ ; stipe cell cylindrical, 6–10 μ long ; head cell more or less lobed, frequently triangular with truncated angles, usually rounded or truncate at the apex. Mucronate hyphopodia on separate branches, usually opposite, inflated in the middle and drawn out into a short neck, 12–18 × 8–10 μ. Mycelial setae not very numerous, grouped round the perithecia, simple, straight, more or less translucent throughout, 200–350 μ long, 8–10 μ thick and dark brown at the base, and tapering somewhat to the paler, acute apex. Perithecia in small groups in the centre of the colonies, black, globose, verrucose, 200–250 μ diameter, superficial cells conical. Asci 3–4-spored, ovate, briefly pedicellate. Spores brown, 4-septate, ellipsoid, cylindrical, rounded at both ends, slightly constricted, 40–50 × 16–20 μ.

Host: *Barosma scoparia* E. and Z., near Grahamstown, July 1876 (MacOwan 1260= de Thuemen's "Mycotheca Universalis," No. 851) [20798 and 21960] ; Dohne Peak, 20.5.98, Galpin [21001] ; Grahamstown, June 1925, Dyer [21000].

The above description is taken from Thuemen's "Mycotheca Universalis," No. 851. It is evident therefore that the type specimen of *M. microthecia* is a *Meliola*, as stated by Gaillard, and that Thuemen's description of hyaline spores is either incorrect or refers to an immature specimen. As the type specimen has been correctly named, we prefer to accept Thuemen's original nomenclature.

37. **Meliola sinuosa** Doidge.

Trans. Roy. Soc. South Africa 5, p. 735, Pl. 64, Fig. 33 (1917); Stevens, Ann. Myc. 26, p. 283 (1928).

Group number 3111. 5232.

Amphigenous, mostly hypophyllous, forming black velvety colonies 1–5 mm. diameter. Hyphae brown, sinuous, very variable in thickness, and sometimes constricted at the septa, 5–11 μ thick; branches usually opposite and emerging at right angles to the hypha; cells varying in length from 18–44 μ. Capitate hyphopodia alternate or unilateral, very irregularly placed, stipitate, straight or curved, 18–25 $\times$ 12–15 μ; stipe cell short, cylindrical, or slightly broader at the base; head cell 14–15 μ long, variable in form, often globose, ovate or uncinate, occasionally sub-lobed. Mucronate hyphopodia opposite or unilateral, flask or retort-shaped, paler, delicate, 14–20 $\times$ 6–7 μ, the lower part often almost hemispherical, narrowing suddenly into a slender neck, 7–8 $\times$ 2–2·5 μ, which is often inserted obliquely and may be straight or curved. Mycelial setae numerous, scattered, simple, straight, opaque throughout, 250–350 μ long, 8–10 μ thick at the base, and tapering only slightly near the acute apex. Perithecia scattered, black, globose, carbonaceous, 160–220 μ diameter, superficial cells convex. Asci elliptical to ovate, briefly pedicellate, 2-spored. Spores brown, 4-septate, cylindrical, rounded at both ends, slightly constricted, 48–55 $\times$ 15–18 μ, the middle cell being often slightly larger than the rest.

Host: *Trichilia emetica* Vahl., Lemana, Northern Transvaal, 14.8.11, Doidge [1783]; Kentani, Cape Province, 16.12.14, Pegler [8786]; Woodbush, Northern Transvaal, 17.9.23, Doidge [17771].

38. **Meliola Panici** Earle.

Muhlenbergia 1901 p. 12 Sacc. Syll. Fung. 17, p. 550; Bothalia 1, p. 74, Fig. 5 (1922); Stevens, Ann. Myc. 26, p. 261 (1928).

Syn. *Meliola substenospora* Hohn., forma *Rottboelliae* Rehm., Ann. Myc. 15, p. 192 (1917).

Group number 3111. 4223.

Amphigenous, forming minute spots about 1–1·5 mm. diameter, which often become confluent. Mycelium rather dense, branching freely and anastomosing. Hyphae 6–8 μ thick, straight; branches opposite or alternate; cells 13–20 μ long. Capitate hyphopodia alternate or unilateral, and usually forming a wide angle with the hyphae, usually one to each cell, 16–20 μ long; stipe cell usually cylindrical, 6–8 μ long; head cell broader than long, irregular in shape, usually 3–4-lobed or uncinate, usually truncate or rounded at the apex. Mucronate hyphopodia on separate branches, paler, opposite, inserted at right angles, broadly ampulliform, with a short thick neck, 12–15 μ long. Mycelial setae simple, straight, fairly numerous, 400–600 μ long, 8–10 μ thick and almost opaque at the base, tapering gradually towards the blunt apex, which is more translucent. Perithecia scattered, black, globose, verrucose, 160–200 μ diameter; superficial cells convex or conical. Asci 3–4-spored, evanescent. Spores cylindrical, 4-septate, slightly constricted, rounded both ends, 40–45 $\times$ 12–15 μ.

Host: *Stipa dregeana* Steud., var. *elongata*, Langholm Estates, Bathurst, 14.7.19, Doidge [12358]; Alexandria, 10.7.27, Doidge [22345].

39. **Meliola Carissae** Doidge.

Bothalia 1, p. 72 Fig. 1 (1922); Stevens, Ann. Myc. 26, p. 260 (1928).
Group number 3111. 4223.

Amphigenous, forming irregular black spots 5–6 mm. diameter, or becoming confluent and covering larger areas. Mycelium forming an irregular network. Hyphae fuscous, straight or slightly undulating, 6–8 μ thick, not infrequently constricted at the septa; branches opposite, forming an acute angle (about 45 degrees) with the hypha; cells 20–30 μ long. Capitate hyphopodia alternate or unilateral, usually one to each cell but rather irregular, 18–30 μ long; stipe cell 4–10 μ long, usually distinctly attenuate towards the base; head cell very variable in form, narrow-ovate, cuneate or sub-lobed, mostly truncate at the apex, less frequently rounded or retuse, 8–15 μ broad. Mucronate hyphopodia not very numerous, unilateral or alternate, ampulliform, with a short thick neck, 18–20 $\times$ 6–7 μ. Mycelial setae fairly numerous, simple, straight, 550–700 μ long, opaque and 9–10 μ thick at the base, and tapering very gradually to the blunt apex, which is somewhat translucent. Perithecia not very numerous, scattered, black, globose, minutely verrucose, 150–200 μ diameter; surface cells small, convex. Asci 2-spored, evanescent. Spores oblong-cylindrical, slightly constricted, rounded at both ends, brown, 43–47 $\times$ 16–20 μ; the central cell is often slightly larger than the rest.

Host: *Carissa arduina* Lam., Kentani, Cape Province, 6.9.15, Pegler [9129]; Van Stadens Pass, Cape Province, 13.11.17, Doidge [10870]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12296]; Langholm Estates, Bathurst, 14.7.19, Doidge [12341]; Kowie, Cape Province, 15.7.19, Doidge [12361]; East London, Cape Province, 19.7.19, Doidge [12408]; Stella Bush, Durban, 11.3.21, Schilz [14702]; Storms River, Humansdorp Dist., 15.5.23, Doidge [17189].

40. **Meliola Loxostylidis** Doidge.

Trans. Roy. Soc. South Africa 8, p. 114, Pl. 6, Fig. 6 (1920); Stevens, Ann. Myc. 26, p. 279 (1928).
Group number 3111. 4231.

Hypophyllous, forming black spots 3–4 mm. diameter. Hyphae brown, tortuous, of uneven thickness, 5–9 μ thick; cells very variable in length; branches irregular, anastomosing. Capitate hyphopodia alternate or often unilateral, stipitate, 20–30 $\times$ 10–17 μ; stipe cell cylindrical, straight or curved, 5–15 μ long; head cell ovate, uncinate or triangular, sometimes sub-lobed, rounded or truncate at the apex. Mucronate hyphopodia not numerous, opposite, alternate or unilateral, pyriform, 13–17 $\times$ 6–7 μ. Mycelial setae not very numerous, simple, straight, 140–240 μ long, pellucid throughout, not attenuated, apex blunt, 6–7 μ thick. Perithecia scattered, black, globose, verrucose, 200–240 μ diameter; superficial cells rounded or conical. Asci 2–4-spored, evanescent. Spores 4-septate, cylindrical, slightly constricted, rounded at both ends, 37–47 $\times$ 17–20 μ.

Host: *Loxostylis alata* Spreng., Paddock, Natal, 23.12.13, van der Bijl [8376]; Van Stadens Pass, 13.11.17, Doidge [10921]; Howieson's Poort, Grahamstown, 17.11.17, Doidge [10970].

41. **Meliola Cryptocaryae** Doidge.

Trans. Roy. Soc. South Africa 8, p. 112, Pl. v, Fig. 2 (1920); Stevens, Ann. Myc. 26, p. 284 (1928).

Syn. *Meliola celtidicola* van der Bijl, South African Journ. Sci. 23, p. 283 (1926).
Group number 3111. 5343.

Hypophyllous, forming round or irregular, rather thin, dull greyish-black spots, 4–10 μ diameter, often confluent and covering a large part of the leaf surface. Mycelium fairly well developed. Hyphae brown, undulating, irregularly tortuous or torulose, of irregular thickness (6–10 μ); branches opposite or irregular; cells 20–50 μ long. Capitate hyphopodia alternate, usually one to each cell, 25–35 μ long, briefly stipitate; stipe cell

cylindrical, 6–10 μ long: head cell very irregular in form, curved, hooked or sub-lobed, 10–20 μ broad, rounded, truncate or retuse at the apex. Mucronate hyphopodia paler, opposite, usually on separate short branches, ampulliform, with a short curved neck, 15–25 $\times$ 7–8 μ. Mycelial setae not numerous, except in the neighbourhood of the perithecia, straight, or more or less flexuous, simple, 400–500 μ long, less frequently up to 800 μ long, opaque and 7–10 μ thick at the base, and gradually attenuated to the blunt apex, which is more or less pellucid and 3 μ thick. Perithecia in small groups or scattered, black, globose, 240–320 μ diameter; superficial cells convex. Asci 2-spored, evanescent. Spores 4-septate, cylindrical, tapering slightly towards the rounded ends, slightly constricted, 50–60 $\times$ 18–22 μ.

Hosts: *Cryptocarya latifolia* Sond., Umbilo, Durban, 29.10.16, van der Bijl [11016]; Stella Bush, Durban, 4.8.17, van der Bijl [11352].

Cryptocarya transvaalensis Burtt Davy, Haenertsburg, Northern Transvaal, 14.9.23, Doidge [17775].

Cryptocarya Woodii Engl., Mayville, Natal, 22.7.15, Medley Wood [9025]; Zwartkop, near Pietermaritzburg, 19.7.18, Doidge [11603]; East London, 19.7.19, Doidge [12410]; Winters Kloof, Natal, 13.9.19, Doidge [12442]; Table Mountain, near Pietermaritzburg, 12.7.21, Doidge [14949].

Cryptocarya sp., Durban, Natal, van der Bijl (van der Bijl 910) [23371].

Van der Bijl 910 (the type specimen of *M. celtidicola*) is indistinguishable from *M. Cryptocaryae*, and, moreover, the host is not *Celtis Soyauxii* but *Cryptocarya* sp. It is possibly *Cryptocarya myrtifolia*, but the material is too scanty for specific diagnosis.

42. **Meliola torta** Doidge.

Trans. Roy. Soc. South Africa 5, p. 726, Pl. 60, Fig. 16 (1917). Ibid. 7, p. 193, Fig. 1 (1919.) Stevens, Ann. Myc. 26, p. 283 (1928).

Group number 3111. 6343.

Amphigenous, forming thin black colonies, 5–10 mm. diameter. Hyphae forming an irregular network, brown, slender, undulating, 5–7 μ thick; branching irregular; cells 25–40 μ long. Capitate hyphopodia alternate or unilateral, distant, slender, 25–40 μ long; rarely up to 60 μ long; stipe cell varying in form and size, sub-cylindrical but usually tapering towards the base, and more or less bent or curved, less frequently straight, occasionally 1–2-septate, 10–20 μ long or even up to 40 μ long; head cell very variable in form and size, mostly 14–25 μ long and 14–20 μ broad, usually variously lobed and often hooked or twisted, rounded or truncate at the apex. Mucronate hyphopodia rather numerous, interspersed with the capitate hyphopodia, opposite or unilateral 1-celled or occasionally 2-celled, slender ampulliform with a long neck, 20–36 $\times$ 6–7 μ. Mycelial setae not numerous except near the perithecia, simple, straight or sub-falcate, 300–600 μ long, 10–11 μ thick at the base and tapering very gradually to a blunt apex which is not more than 3 μ thick, opaque except near the apex. Perithecia few and scattered, black, globose, 250–400 μ diameter; superficial cells very large, projecting, mammillate. Asci 2-spored. Spores ellipsoid, 4-septate constricted, rounded at the ends, the central cell being distinctly larger than the lateral ones 54–67 $\times$ 20–22 μ.

Host: *Trichocladus crinitus* Pers., Izelini Forest, Kingwilliamstown, 14.6.15, Emmett [9064]; Woodville Forest, George, 11.11.17, Doidge [10939]; Izelini Forest, Kingwilliamstown, 22.6.18, [11610]; Storms River, Humansdorp District, 15.5.23, Doidge [17170]; Deepwalls, Knysna District, 13.5.23, Doidge [17195].

Nearly always associated with *Irene scabra* on the same leaves.

43. **Meliola Doidgeae** Syd. n. sp.

Trans. Roy. Soc. South Africa 5, p. 733 (1917), sub. *M. amphitricha*.

Group number 3111. 4222.

Amphigenous, colonies more numerous on the upper surface, velvety black, round, up to 4 mm. diameter, often confluent. Mycelium compact, radiating. Hyphae almost

straight, fuscous, 7–9 μ thick; cells 10–20 μ long; branches opposite, often emerging at a wide angle (slightly less than a right angle). Capitate hyphopodia alternate (rarely opposite), usually one to each cell, 15–20 $\times$ 8–10 μ, stipe cell short, cylindrical, head cell cylindrical or ovate. Mucronate hyphopodia on separate branches, opposite, fairly numerous, 10–20 $\times$ 6–8 μ, ampulliform, with a very short, oblique or curved neck. Mycelial setae fairly numerous, 240–360 μ long, simple, straight, apex usually acute but sometimes blunt, somewhat translucent throughout, 6–7 μ thick at the base. Perithecia black, globose verrucose, carbonaceous, 160–200 μ diameter, superficial cells conical. Asci 2-spored, evanescent. Spores cylindrical, slightly constricted, rounded at both ends, 35–43 $\times$ 10–13·5 μ, cells often somewhat unequal in size.

Host: *Sapindus oblongifolius* Sond., Stella Bush, Durban, 11.7.11, Doidge [1572]; Stella Bush, 2.7.12, Doidge [2520]; Durban, July 1917, Franks [8404]; Stella Bush, 1.7.14, Franks [9504]; Umkomaas, Natal, 20.4.19, Bottomley [11896]; Bluff, Durban, 11.3.21, Schilz [14703].

44. **Meliola oleicola** Doidge.

Bothalia 1, p. 73, Fig. 4 (1922). Stevens, Ann. Myc. 26, p. 276 (1928).
Group number 3111. 4332.

Amphigenous, forming round, dull black spots, 2–4 mm. or becoming confluent and covering large areas of the leaf surface. Mycelium olivaceous, freely branched and interwoven; branches opposite, emerging at an acute angle (about 45°); cells 16–25 μ long; Capitate hyphopodia alternate, usually one to each cell, 26–30 μ long; stipe cell short, cylindrical; head cell ovate or sub-cylindrical, straight or somewhat curved, 18–20 $\times$ 10 μ; closely appressed to or forming an acute angle with the hypha. Mucronate hyphopodia on separate branches, opposite alternate or unilateral, slender ampulliform, base not much wider than the curved neck, 20–23 $\times$ 6–7 μ. Mycelial setae numerous, scattered, simple, straight or flexuous, 240–300 μ long, 9–10 μ thick at the base, and tapering somewhat towards the apex which is acute or sub-acute; when mature, opaque right to the apex. Perithecia not very numerous, black, globose, 220–250 μ diameter, verrucose, surface cells convex. Asci 2 to 4-spored, early evanescent. Spores oblong 4-septate, very slightly constricted, broadly rounded at both ends, chestnut brown, 45–50 $\times$ 20–23 μ.

Hosts: *Olea capensis* L., Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12331 and 12332]; Storms River, Humansdorp District, 15.5.23, Doidge [17232].

Olea foveolata E. Mey., Langholm Estates, Bathurst, 14.7.19, Doidge [12351]; Kowie, Cape Province, 15.7.19, Doidge [12364]; Kowie River Bush, 30.9.19, Britten [14218].

Olea laurifolia Lam., Woodbush, Northern Transvaal, 4.8.11, Doidge [1767 and 1835]; Tabankulu, Pondoland, 4.4.15, [9103]; Woodville Forest, George, 11.11.17, Doidge [10937]; Howiesons Poort, Grahamstown, 17.11.17, Doidge [10967]; Buccleuch, Natal, 17.7.18, Doidge [11557]; Assegai Bush, Humansdorp District, 16.5.23, Doidge [17236].

Olea Pegleri C. H. Wright, Kentani, Cape Province, 29.8.14 and 16.12.14, Pegler [8382 and 8785].

45. **Meliola polytricha** Kalch. et Cke.

Grevillea, p. 72 (1880); Gaill., Le Genre Meliola, p. 92, Trans. Roy. Soc. South Africa 5, p. 735 (1917), Pl. 65, Fig. 34. Stevens, Ann. Myc. 26, p. 274 (1928).
Group number 3111. 5322.

Amphigenous, mostly hyphophyllous, forming round, velvety black colonies 2–3 mm. diameter rarely up to 5 mm. diameter. Mycelium dense and closely compact, olivaceous brown; hyphae radiating, much-branched, almost straight, 8–10 μ thick; cells mostly 16–22 μ long; branches opposite or alternate, emerging at an acute angle with the hyphae, and later through compression running almost parallel with them. Capitate hyphopodia alternate, usually one to each cell, closely appressed to the hyphae, stipitate, 20–25 μ long; stipe cell short, cylindrical; head cell broadly ovate or globose, 14–16 μ long and 12–14 μ

broad, sometimes flattened by contact. Mucronate hyphopodia not very numerous on separate short branches, opposite ampulliform or pyriform with a rather thick neck, 10–18 × 6–8 μ. Mycelial setae numerous, simple, straight or somewhat flexuous, 250–350 μ long, 8–10 μ thick at the base and tapering only slightly, opaque right up to the acute apex. Perithecia numerous, scattered, black, globose, minutely verrucose, 160–200 μ diameter; superficial cells small, slightly convex or conical. Asci 2-spored, evanescent. Spores brown, 4-septate, cylindrical, rounded at both ends, constricted, 50–57 × 16–22 μ.

Host: *Pittosporum viridiflorum* Sim, Inanda, Natal, Medley Wood 222 [10358]; Claridge, Natal, 31.5.15, Doidge [8996]; Claridge 15.7.21, Doidge [14945].

There seems to be considerable confusion with regard to the identity of this species. It was described in Grevillea VIII, p. 72 (1880) as follows :—

"*Meliola polytricha* Kalch. et Cke. in Herb. Kalch. Hypophylla vel amphigena, atra maculaeformis. Mycelio effuso, radiato conidiifero. Conceptaculis globosis; appendiculis erectis, simplicibus, acutis, plerumque flexuosis. Sporangiis ovatis. Sporidiis cylindricis, obtusis, 4-septatis, constrictis atrobrunneis. Conidiis clavatis, 3–5 septatis (·05 × ·008 mm.) in hyphis erectis flexuosis gerentibus.

On leaves. (Wood) No. 222.

Conceptacles about one-fifth of a millimetre in diameter. The conidia greatly resemble some species of *Helminthosporium*."

Medley Wood's No. 222 is therefore the type, and a part of the type collection is in the National Herbarium. By careful comparison of the host and fungus with later collections there can be no doubt whatsoever that the host is *Pittosporum viridiflorum*.

In Grevillea IX, p. 34 (1880), two collections of MacOwan's are assigned to this species, namely, No. 1256 on *Osyris compressa* and No. 1262 on *Cunonia capensis*.

Part of MacOwan's material of these two numbers has been examined and it is evident that neither is identical with Wood's No. 222. Both differ in habit; No. 1262 has lobed hyphopodia, and 1256 has more slender hyphopodia than *M. polytricha* and tapering setae with a blunt tip. The dimensions of the spores are also different. Gaillard (Le Genre Meliola, p. 92) does not mention the type specimen, but quotes the two latter; he also adds two other hosts one of which is *Schinus molle* and gives a description which does not apply to the type; differing in almost every particular. The above description is taken from the type specimen.

46. **Meliola Psychotriae** Earle.

Bull. New York Bot. Gard. 3, p. 308 (1905). Stevens, Ann. Myc. 26, p. 246 (1928).

Syn. *Meliola microspora* Pat. et. Gaill., Bull. Soc. Myc. 1888, p. 104 Gaill., Le Genre Meliola, p. 75. var. *africana* Doidge, Trans Roy. Soc. South Africa 5, p. 732, Pl. 63, Fig. 29 (1917).

Group number. 3111. 3222.

Amphigenous, forming very minute black colonies 0·5–1 mm. in diameter. Hyphae slender, radiating, 5–8 μ thick, cells 20–35 μ long; branches few, opposite or alternate. Capitate hyphopodia alternate or unilateral, usually one to each cell, stipitate, broadening gradually from the base to just below the rounded apex 16–22 × 7–8 μ; head cell ovate or sub-globose 14–16 μ long. Mucronate hyphopodia interspersed with the capitate hyphopodia, opposite, slender ampulliform, 15–20 × 6–7 μ. Mycelial setae, not very numerous, mostly grouped round the perithecia, simple, straight or somewhat flexuous, 230–320 μ long, 6–8 μ thick at the base and tapering to the blunt apex, translucent throughout, but dark brown at the base and paler at the apex, often sub-torulose. Perithecia few, in a small group in the centre of the colony, black, globose, verrucose, 150–180 μ diameter; superficial cells convex or conical. Asci ovate, briefly pedicellate, 3–4 spored. Spores 4-septate, cylindrical, broadly rounded at both ends, very slightly constricted, 23–33 × 10·5–15 μ, frequently broader at one end than the other.

Hosts: *Plectranthus ciliatus* E. Mey., Grahamstown, June 1876, MacOwan 1259 [20799]. (This specimen is labelled *M. capnodioides*, and is included by Gaillard under *M. amphitricha*.)

Labiatae undet. (? *Plectranthus*, ? *Stachys*), Inanda, Medley Wood [10350 and 10353]; Buccleuch, Natal, 17.7.18, Doidge [11576]; Woodbush, Northern Transvaal, 4.8.11, Doidge [1766], Woodbush 18.9.23, Doidge [17768].

Galopina circaeoides Thun., Woodbush, 3.8.11 and 18.9.23, Doidge [1760 and 17752]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12323].

Barleria obtusa Nees., Amanzimtoti, 20.5.13, Doidge [6623].

Hypoestes verticillaris R. Br., Woodbush, 18.9.23, Doidge [17749].

Isoglossa Woodii C. B. Cl., Stella Bush, Durban, 4.8.17, van der Bijl [11351], same locality 7.4.18, Bottomley [11377].

Rhinacanthus communis Nees., Town Bush Valley, Pietermaritzburg, 21.3.16, Doidge [9721].

47. **Meliola Popowiae** Doidge.

Trans. Roy. Soc. 8, p. 142, Pl. 8, Fig. 8 (1920); Stevens, Ann. Myc. 26, p. 242 (1928).

Group number 3111. 3222.

Epiphyllous, effuse, forming thin black pellicles. Hyphae sparse, brown, undulating, uneven, 6–7 μ thick, cells varying from 10–30 μ in length, branches opposite or irregular. Capitate hyphopodia unilateral or alternate, occurring very irregularly, usually at right angles to the hypha, stipitate, 12–15 $\times$ 8–10 μ; stipe cell short, cylindrical; head cell globose. Mucronate hyphopodia interspersed with the capitate hyphopodia, opposite or scattered, slender ampulliform, straight or curved, 15–20 $\times$ 5–7 μ. Mycelial setae scarce, mostly developed round the perithecia, simple, straight or slightly flexuous, 300–500 μ long, opaque and 10 μ thick at the base, slightly attenuated towards the blunt apex, which is 6-7 μ thick and slightly translucent. Perithecia few, globose, black, carbonaceous, verrucose, 180–200 μ diameter; superficial cells convex or conical. Asci evanescent. Spores 4-septate, cylindrical, constricted, rounded at both ends, 35–40 $\times$ 13–16 μ.

Host: *Popowia caffra* Hook. fil., Kentani, Cape Province, 1.3.15, Pegler [8882]; Winters Kloof, Natal, 1.6.15, Doidge [8990]; Buccleuch, Natal, 17.7.18, Doidge [11587]; Hilton Road, Natal, 21.7.18, Doidge [11607]; Winters Kloof, Natal, 13.9.19, Doidge [12435].

This is a very inconspicuous species, and it is usually badly parasitised.

48. **Meliola dactylipoda** Syd. n. sp.

Group number 3111. 4222.

Epiphyllous, forming rather thin, dull black, round to irregular spots up to 5 mm. diameter. Mycelium not dense, reticulate, composed of fuscous hyphae, which are straight or slightly undulating, 7–10 μ thick; cells 25-30 μ long; branches opposite, usually diverging almost at right angles to the hypha. Capitate hyphopodia alternate, usually one to each cell, 27–37 μ long, 8–10 μ thick, cylindrical, straight or slightly undulating, rounded at the apex; stipe cell 5–10 μ long. Mucronate hyphopodia fairly numerous, interspersed with the capitate hyphopodia, opposite, ampulliform, with a short curved neck, 13–20 $\times$ 6–8 μ. Mycelial setae not numerous, mostly in the neighbourhood of the perithecia, simple, straight, 300–500 μ long, opaque and 7–10 μ thick at the base, tapering gradually to the blunt apex, which is more or less translucent. Perithecia scattered, black, globose, about 200 μ diameter (only a few mature); superficial cells strongly convex. Asci not seen. Spores brown, 4-septate, oblong, broadly rounded at both ends, very slightly constricted, 36–43 $\times$ 16–18 μ.

Hosts: *Cryptocarya Woodii* Engl., Duncairn, near Pietermaritzburg, 13721, Doidge [14953].

Cryptocarya liebertiana Engl., Inyanza, Rhodesia, August 1920, Eyles [15518].

Differs from *M. Cryptocaryae* in the size of its spores and the form of its hyphopodia.

49. **Meliola cylindripoda** Doidge.

Trans. Roy. Soc. South Africa 8, p. 138, Pl. 7, Fig. 2 (1920); Stevens, Ann. Myc. 26, p. 279 (1928).

Group number 3111. 4232.

Amphigenous, usually hypophyllous, forming thin black pellicles 3–6 mm. diameter, often more or less confluent. Mycelium forming an open network. Hyphae fuscous, 6–7 μ thick, somewhat undulating; branches opposite; cells 20–27 μ long. Capitate hyphopodia, alternate or unilateral, usually one to each cell, 12–16 $\times$ 6–9 μ; stipe cell very short, cylindrical; head cell cylindrical or sub-ovate. Mucronate hyphopodia few, opposite or scattered, ampulliform or pyriform, 16 $\times$ 6–7 μ. Mycelial setae not numerous except near the perithecia, simple, straight, or more or less flexuous, 300–500 μ long, 6–7 μ thick at the base, and tapering gradually to the tip, which is blunt and 1·5–3 μ thick, opaque at the base, more translucent near the apex. Perithecia globose, black, scattered, minutely verrucose, 200–240 μ diameter; superficial cells slightly convex. Asci evanescent. Spores dark brown, cylindrical, 4-septate, rounded at both ends, slightly constricted, 40–44 $\times$ 15–17 μ.

Host: *Eugenia* sp. (near *Eu. Zeyheri*), Zwartkop, near Pietermaritzburg, 19.7.18, Doidge [11596], Zwartkop 6.9.19, Doidge [12437]; Karkloof, near Pietermaritzburg, 14.7.21, Doidge [14943].

50. **Meliola Knowltoniae** Doidge.

Bothalia 1, p. 208, Fig. 6 (1924); Stevens, Ann. Myc. 26, p. 260 (1928).

Group number 3111. 3222.

Epiphyllous, forming rather thin black carbonaceous spots up to 5 mm. diameter; mycelium consisting of brown, rather sinuous hyphae, 9–11 μ thick (usually 10 μ); cells mostly 35–40 μ long; branches opposite. Capitate hyphopodia alternate, usually one to each cell, stipitate, 27–34 $\times$ 13·5–17 μ, the majority at an angle of about 45° with the hypha, but sometimes more widely divergent; stipe cell cylindrical, 6·5–10 μ long; head cell clavate, sub-lobed or subuncinate, in- or recurved, but usually the latter. Mucronate hyphopodia fairly numerous near the centre of the colony, opposite, not paler than the capitate hyphopodia, 16–17 $\times$ 8–10 μ, ampulliform with rather a short neck, 3·5 μ thick. Mycelial setae most numerous in the neighbourhood of the perithecia, straight or somewhat flexuous, 400–500 μ long, 10 μ thick at the base, the majority tapering gradually to the blunt and somewhat less opaque apex, which is 2–3 μ thick; a few of the setae are less tapering, and have a blunt apex up to 5 μ thick. Perithecia in groups in the centre of the colony, black, globose, carbonaceous, slightly rough, 160–200 μ diameter. Asci 2-spored, evanescent. Spores 4-septate, cylindrical, broadly rounded at both ends, slightly constricted, brown, 42–46 $\times$ 16·5–20 μ.

Host: *Knowltonia vesicatoria* Sims., Storms River, Humansdorp Dist., 15.5.23, Doidge [17177].

51. **Meliola Goniomae** Doidge comb. nov.

Syn. *Amazonia Goniomae* Doidge, Bothalia 1, p. 204 (1924); Stevens, Ann Myc. 25, p. 414 (1927).

Group number 3111. 4232.

Amphigenous, forming irregular circular dull black spots up to 7 mm. diameter. Hyphae olivaceous, brown, undulating, 6–8 μ thick; cells 20–27 μ long; branches usually opposite, less frequently unilateral. Capitate hyphopodia alternate or unilateral, stipitate, usually one to each cell, straight or curved, 20–27 $\times$ 8·6–10 μ; stipe cell short, cylindrical head cell cylindrical or ovate, often curved. Mucronate hyphopodia very numerous in some colonies on separate branches, or mixed with the capitate hyphopodia opposite, curved, slender ampulliform, with a short rather thick neck 12–15 $\times$ 5–7 μ. Mycelial setae usually present in colonies with mature perithecia, simple, straight, or more or less flexuous, somewhat

translucent throughout, apex blunt, 300–400 μ long, 6–7 μ thick at the base. Perithecia at first radiating in structure, formed of radiating hyphae about 6 μ thick, later becoming globose, black, verrucose, 200–220 μ diameter, superficial cells rounded or conical. Asci 2-spored, evanescent. Spores 4-septate, flattened cylindrical, brown, broadly rounded at both ends, slightly constricted, 40–47 $\times$ 15–16·5 $\times$ 10–12 μ.

Host: *Gonioma Kamassi* E. Mey., Van Stadens Pass, 9.3.16, Bottomley [9561]; Woodville Forest, George, 11.11.17, Doidge [10938]; Keurkloof Forest, George, 9.5.23, Doidge [17109]; Deepwalls, Knysna, 13.5.23, Doidge [17209]; Storms River, Humansdorp Dist., 15.5.23, Doidge [17230]; Assegai Bush, Humansdorp Dist., 16.5.23, Doidge [17235].

This species seems to vary in the different collections. The mycelium and hyphopodia are identical in all, but in some there are no mycelial setae and the young perithecia are decidedly radiating in structure. It would appear that the perithecia long remain dimidiate, but in most cases swell and become spherical at maturity; this species may be regarded as a transition form between *Amazonia* and *Meliola*, but is more properly included in the genus *Meliola* as in the mature perithecia are typically spherical.

52. **Meliola Osyridis** Doidge n. sp.

Group number 3111. 4232.

Amphigenous, but mostly hypophyllous, forming round, black colonies up to 3 mm. diameter, often becoming confluent and forming larger black areas of irregular outline. Mycelium brown, radiating; hyphae almost straight, or gently undulating 6–8 μ thick; cells 10–20 μ long, branches usually opposite. Capitate hyphopodia stipitate, alternate or unilateral, usually one to each cell, 20–30 $\times$ 7–10 μ; stipe short, tapering somewhat to the base, head cell ovate or cylindrical. Mucronate hyphopodia rather numerous, on separate branches, opposite, ampulliform with a short, rather thick curved neck, 15–17 $\times$ 6–10 μ. Mycelial setae fairly numerous, simple, straight or slightly flexuous, 240–340 μ long, 7–8 μ thick and opaque at the base, tapering gradually to the blunt apex which is usually somewhat translucent. Perithecia grouped in the centre of the colony, black, globose, minutely verrucose, 200–250 μ diameter, superficial cells rather small convex or conical. Asci 2-spored evanescent. Spores cylindrical, brown, 4-septate, broadly rounded at both ends, very slightly constricted, 43–47 $\times$ 17–20 μ.

Hosts: *Osyris compressa* A.DC., near Grahamstown, June 1876, MacOwan 1256 [20771]; Natal, Medley Wood 448 [10359]; Grahamstown, 15.11.17, Doidge [10954], same locality June 1919, Britten [12187].

Rhoiocarpus capensis A.DC., Van Stadens Pass, Cape Province, 13.11.17, Doidge [10866]; Howiesons Poort, Grahamstown, 17.11.17, Doidge [10963]; Langholm Estates, Bathurst District, 14.7.19, Doidge [12349]; Howiesons Poort, 12.7.19, Doidge [12374]; Van Stadens Pass, 19.5.23, Doidge [17253].

53. **Meliola littoralis** Syd. n. sp.

Sub. *Meliola amphitricha* Fr. in Trans. Roy. Soc. South Africa 5, p. 733, 1917.

Group number 3111. 4233.

Amphigenous, but mostly epiphyllous; colonies rather thin, black, sub-circular, 2–5 mm. diameter, or becoming irregular and larger by confluence. Mycelium arachnoid; hyphae brown, straight or somewhat sinuous, 7–8 μ thick, cells variable in length, 20–40 μ; branches opposite, emerging at an acute angle with the main hyphae. Capitate hyphopodia alternate or unilateral, usually one to each cell, stipitate, 23–30 μ long; stipe cell 7–10 μ long, sub-cylindrical, or narrowing towards the hyphae; head cell ovoid or sub-cylindrical, 10–12 μ thick. Mucronate hyphopodia rather numerous, opposite, alternate or unilateral, on separate hyphae which are rather more slender than those bearing the capitate hyphopodia, ampulliform with a rather short, thick neck, 13–16 μ long. Mycelial setae rather numerous, scattered, but more numerous in the vicinity of the perithecia, 300–640 μ long, opaque, black and 8–10 μ thick at the base, tapering gradually towards the more translucent, blunt

apex. Perithecia fairly numerous, scattered black, carbonaceous, globose, 190-240 μ diameter, surface cells convex. Asci ellipsoid 2-4-spored. Spores brown, 4-septate, cylindrical, slightly constricted, broadly rounded at both ends, 40–45 × 17–20 μ.

Hosts: *Burchellia capensis* R. Br., Inanda, Natal, August 1881, Medley Wood 653 [9502 and 10352].

Gardenia globosa Hochst., Kentani, Cape Province, 1.4.12, Pegler [2214]; Winkle Spruit, 28.5.15, Doidge [9013 and 9014]; Umgeni, 16.7.15, Medley Wood [9038].

Gardenia Rothmannia Linn. fil., Louis Trichardt, Northern Transvaal, 8.4.19, Putterill [11830]; Umkomaas, Natal, 25.4.19, Bottomley [11895].

Grumilea capensis Sond., Louis Trichardt, 8.4.19, Putterill [11826]; Umkomaas, 24.5.19, Bottomley [11891].

Grumilea cymosa E. Mey., Amanzimtoti, 10.7.11, Doidge [1575]; Stella Bush, Durban, 2.7.12, Doidge [2521].

Grumilea globosa Hochst., Kentani, Cape Province, 29.5.12, Pegler [2366].

Keetia transvaalensis Phillips, Buccleuch, Natal, 17.7.18, Doidge [11575].

Pavetta Bowkeri Harv., Krantzkloof, 14.8.14, Van der Bijl [8377].

Plectronia ciliata Dietr., Grahamstown, June 1919, Britten [12188]; Hogg's Back, 15.1.18, Henderson [11346]; Pirie Forest 6.7.27, Doidge [22459].

Plectronia spinosa Klotzsch., Howiesons Poort, Grahamstown, 17.11.17, Doidge [10965].

Plectronia spp., Grahamstown, 17.9.19, Britten [14224]; Keurkloof Forest, George, 9.5.23. Doidge [17108]; Storms River, Humansdorp District, 15.5.23, Doidge [17178]; Deepwalls, Krysna, 13.5.23, Doidge [17196]; Van Stadens Pass, 19.5.23, Doidge [17255].

LATIN DESCRIPTION OF NEW SPECIES.

Irene Nuxiae Syd. nov. spec.

Plagulae amphigenae, in epiphyllo plerumque magis numerosae, laxe vel dense sparsae, ambitu orbiculares, saepe angulatae vel irregulares, 2–4 mm. diam. haud raro confluentes et tunc majores; mycelium ex hyphis opposite ramosis, plerumque rectis vel leniter undulatis olivaceo-brunneis, 5–8 μ crassis, septatis (articulis 15–30 μ longis) compositum. Hyphopodia capitata alternantia vel unilateralia, 16–20 μ longa, semper integra, cellula basali cylindracea vel cylindraceo-conoidea, 3–8 μ longa et 5–7 μ lata cellula apicali late rotundata vel rarius truncata, globosa vel ovoidea, 11–16 μ longa et 9–11 μ lata. Hyphopodia mucronata sat numerosa opposita, praecipue in medio plagularum evoluta, lageniformia, 15–18 μ longa, basi 6–8 μ lata. Perithecia sparsa, globosa, atra, 180–220 μ diam. astoma, cellulis parietis irregularibus protruberantibus, mammillatis, 15–30 μ diam. Asci ovati, breviter pedicellati, bispori. Sporae 4-septatae, brunneae, cylindraceae, utrinque late rotundatae, leniter constrictae, 45–50 × 18–22 μ.

Hab. in foliis *Nuxiae floribundae*, Woodbush, Transvaal, 3.8.11, leg Doidge [1776].

Meliola Allophylli Doidge nov. spec.

Plagulae amphigenae, atrae, sparsae, plus minus orbiculares, usque 2·5 mm. diam. saepe confluentes. Mycelium ex hyphis plus minusve undulatis, alterne ramosis, septatis (articulis 15–27 μ longis), olivaceo-brunneis, 6–7 μ crassis compositum. Hyphopodia capitata alternantia, 15–25 μ longa, cellula basali breviter cylindracea, v. gibbosa, 4–10 μ longa et 6–7 μ lata, apicali irregulariter clavata, truncata v. sub-lobata, 10–17 μ longa et 6–14 μ lata. Hyphopodia mucronata haud numerosa, pallidiora, 15–20 μ longa, plus minus lageniformia, e basi ventricoso-dilatata 6–7 μ lata in collum rectum vel curvatum 3–4 μ latum attenuata. Setae myceliales sat numerosae, sparsae, rectae, pellucide atro-brunneae, 240–400 μ longae, inferne 6–7 μ crassae, apicem versus paulo attenuatae et dilutius coloratae, ad apicem simplices acutae vel bifidae, dentibus minutis vel usque 30 μ longis, acutis. Perithecia in centro plagularum laxe gregaria, atra, globosa, 120–170 μ diam. cellulis parietis leniter convexis, in sicco collapsa. Asci fugaces. Sporae 4-septatae, cylindraceae, utrinque late rotundatae, leniter constrictae, olivaceo-brunneae, 35–40 × 13–17 μ.

Hab. in foliis *Allophylli erosi*, Kowie, Cape Province, 11.8.12, leg. Britten [21009].

Meliola Azimae Doidge nov. spec.

Plagulae amphigenae et caulicolae, sed plerumque epiphyllae, sub-orbiculares, atrae, sparsae, usque 3 mm. diam. saepe confluentes. Mycelium ex hyphis fere rectis fuscis, vix torulosis, opposite ramosis, septatis (articulis 20–35 μ longis) 7–10 μ crassis compositum. Hyphopodia capitata plerumque opposita, rarius alternantia v. unilaterales, 16–24 μ longis et 6–7 μ lata, cellula basali breviter cylindracea, apicali plerumque cylindracea, ad apicem rotundata v. truncata, rarius clavata v. hamata. Hyphopodia mucronata, haud numerosa, inter hyphopodia capitata interspersa, 15–18 μ longa, ampullacea, basi 6–7 μ lata, collo brevi. Setae myceliales, simplices, rectae, atrae opacae fere usque ad apicem, 240–640 μ longae, basi 10–12 μ crassae, prope apicem acutum leniter attenuatae. Perithecia sat numerosa, in centro plagularum laxe gregaria, atra, globosa, 160–250 μ diam. cellulis parietis leniter convexis, in sicco collapsa. Asci 2–3-spori fugaces. Sporae atro-brunneae, cylindraceae utrinque rotundatae, vix constrictae, 43–50 × 16·5–20 μ.

Hab. in foliis caulibusque *Azimae tetracanthae*, East London, 23.7.27, leg. Doidge [22387].

Meliola Behniae Syd. nov. spec.

Plagulae amphigenae, atrae, facile a foliis secedentes, 2–5 mm. diam. Mycelium reticulatum ex hyphis brunneis rectis, opposite ramosis, septatis (articulis 17–20 μ longis) anastomosantibus, 7–9 μ crassis compositum. Hyphopodia capitata alternantia vel unilateralia, 17–20 μ longa; cellula basali breviter cylindracea, 5–7 μ longa; apicali subglobosa, 10–13 μ lata. Hyphopodia mucronata numerosa, alternantia v. opposita, inter hyphopodia capitata interspersa, pyriformia v. ampullacea, collo recto v. curvato, 15–20 μ longa et basi 6–7 μ lata. Setae myceliales numerosissimae, robustae, erectae, prope basim abrupte geniculatae v. curvato-acclivae, atro-brunneae, opacae, 250–350 μ longae, 10–11 μ crassae, ad apicem breviter bi- v. tri-ramosae; ramis 10–17 μ longis, et iterum ad apicem in ramulis duobus v. ternos attenuatos divisis; ramulis 6–10 μ longis, nonnunquam ad apicem bidentatis. Perithecia atra, globosa, 250–300 μ diam. Asci non visi. Sporae rectae, brunneae, cylindraceae, 4-septatae, constrictae, utrinque late rotundatae, 43–46 × 16 μ.

Hab. in foliis *Behniae reticulatae*, Louis Trichardt, Transvaal, 8.4.19, leg. Putterill [11848].

Meliola brachyodonta Syd. nov. spec.

Syn. *Meliola geniculata* Syd. et Butl. var. *macrospora* Doidge, Trans. Roy. Soc. South Africa VIII, p. 109 (1920).

Epiphylla, plagulas orbiculares vel irregulares 1–3 mm. diam. atro-griseas formans; mycelium copiose evolutum ex hyphis undulatis, 6–8 μ crassis, ramosis, septatis (articulis 16–36 μ longis), olivaceo-brunneis compositum. Hyphopodia capitata alternantia, stipitata, 16–24 μ longa; cellula basali breviter cylindracea, 5–10 μ longa et 6–8 μ crassa; apicali ovata, obtuse rotundata, 10–14 μ lata. Hyphopodia mucronata haud numerosa, opposita vel unilateralia, usque 25 μ longa, plus minusve lageniformia e basi ventricoso-dilatata, 6–10 μ lata, subito in collum rectum vel curvatum 3–4 μ crassum attenuata. Setae myceliales sat numerosae, omnino pellucidae, brunneae, sursum sensim dilutiores, 6–8 μ crassae, 200–300 μ longae, prope basim abrupte geniculatae, ad apicem obtusum bis usque quinquies incisae quasi denticulatae (dentibus brevibus acutisque, 3–8 μ longis). Perithecia laxe gregaria, atra, globosa, 180–240 μ diametro, cellulis parietis convexis, vix prominulis. Asci bispori, ovati, brevissime pedicellati, fugaces. Sporae brunneae, 4-septatae, oblongae vel cylindraceae, utrinque rotundatae, leniter constrictae, 40–43 × 16–18 μ.

Hab. in foliis *Rhois tomentosae*, Van Stadens Pass, Cape Province, 13.11.17, leg. Doidge [10879].

Meliola buxicola Doidge nov. spec.

Plagulae amphigenae sed plerumque epiphyllae, atrae, velutinae, suborbiculares, usque 5 mm. diam. Mycelium ex hyphis brunneis, rectiusculis, opposite ramosis, septatis (articulis 13–20 μ longis) 6·5–8 μ crassis compositum. Hyphopodia capitata opposita, alternantia v. unilateralia, 15–20 μ longa v. rarius usque 24 μ longa; cellula basali breviter cylindracea; apicali sub-globosa v. rarius clavato-cylindracea, circ. 10 μ diam. Hyphopodia mucronata haud numerosa, inter hyphopodia capitata interspersa, praecipue in centro plagularum evoluta, opposita v. solitaria, 15–18 μ longa et basi 6–8 μ lata, ampullacea collo recto v. curvato. Setae myceliales numerosae, simplices rectae, 300–250 μ longae, basi 7–9 μ crassae, atro-brunneae, opacae, ad apicem obtusum pellucidem sensim attenuatae. Perithecia sat numerosa, sparsa, atra, globosa, 200–250 μ diam. in sicco collapsa, cellulis parietis convexis v. conoideis. Asci fugaces. Sporae brunneae, 4-septatae, cylindraceae v. sub-ellipsoideae, utrinque late rotundatae, leniter constrictae, 43–47 × 16·5–22 μ.

Hab. in foliis *Buxi MacOwani*, East London, 23.7.27, leg. Doidge [22388].

Meliola Cnestidis Doidge nov. spec.

Plagulae amphigenae, plus minus orbiculares v. irregulares, usque 5 mm. diam. Mycelium ex hyphis fuscis undulatis opposite ramosis, septatis (articulis 20–30 μ longis) 6–8 μ crassis compositum. Hyphopodia capitata alternantia v. unilateralia, interdum opposita, 18–20 μ longa, cellula basali plerumque cylindracea, rarius cylindraceo-conoidea, interdum septata, 5–16 μ longa; apicali 6–16 μ lata, plerumque integra, et hamata v. ante v. retro curvata, rarius recta et truncata v. sublobata. Hyphopodia mucronata haud numerosa, praecipue in centro plagularum evoluta, ampullacea, collo recto v. curvato, 16–20 μ longa et 6–7 μ lata. Setae myceliales sat numerosa, praecipue juxta perithecia evolutae, simplices, rectae, atro-brunneae, 250–350 μ longae, basi opacae et 7–8 μ latae, sursum haud vel vix attenuatae, ad apicem acutae et plus minus pellucidae. Perithecia sparsa, atra, globosa, 150–200 μ diam. minute verrucosa. Asci 2–3-spori, fugaces. Sporae oblongae, atro-brunneae, 4-septatae, vix constrictae, 42–47 × 15–17 μ.

Hab. in foliis *Cnestidis natalensis*, Kentani, Cape Province, 10.12.15, leg. Pegler [9527].

Meliola dactylipoda Syd. nov. spec.

Plagulae epiphyllae tenues, atrae, orbiculares v. irregulares usque 5 mm. diametro. Mycelium reticulatum effusum ex hyphis fuscis rectiusculis v. plus minus undulatis opposite ramosis septatis (articulis 25–30 μ longis) 7–10 μ crassis compositum. Hyphopodia capitata alternantia 27–37 μ longa, 8–10 μ lata, cylindracea recta v. sub-curvata ad apicem rotundata, cellula basali 5–10 μ longa. Hyphopodia mucronata sat numerosa, opposita ampullacea collo brevi curvato, 13–20 μ longa et basi 6–8 μ lata. Setae myceliales haud numerosae praecipue juxta perithecia evolutae, simplices, rectae, 300–500 μ longae, basi opacae et 7–10 μ crassae, sursum ad apicem obtusum pellucidum sensim attenuatae. Perithecia sparsa, atra, globosa, circ. 200 μ diam. cellulis parietis convexis. Asci non visi. Sporae brunneae, 4-septatae, oblongae, utrinque late rotundatae, vix constrictae, 39–43 × 16–18 μ.

Hab. in foliis *Cryptocaryae Woodii*, Duncairn, prope Pietermaritzburg, Natal, 13.7.21, leg. Doidge [14953].

Meliola Doidgeae Syd. nov. spec.

Plagulae amphigenae, saepius epiphyllae, atrae, velutinae, orbiculares, usque 4 mm. diam. saepe confluentes, Mycelium compactum ex hyphis rectiusculis, fuscis, opposite ramosis, septatis (articulis 10–20 μ longis) 7–9 μ crassis compositum. Hyphopodia capitata alternantia raro opposita, 15–20 μ longa, cellula basali breviter cylindracea, apicali cylindracea vel ovata, 6–8 μ lata. Hyphopodia mucronata sat numerosa, praecipue in centro plagularum evoluta, ampullacea collo brevi obliquo v. curvato, 10–20 μ longa, basi 6–8 μ lata. Setae myceliales sat numerosae, simplices rectae, 240–360 μ longae, per totam longitudinem plus

minus pellucidae, basi 6–7 μ crassae, apice plerumque acutae sed nonnunquam obtusae. Perithecia atra, globosa, 160–200 μ diam. ; cellulis parietis sub-conoideis. Asci bispori fugaces. Sporae cylindraceae, vix constrictae utrinque rotundatae, 35–43 $\times$ 10–13·5 μ ; cellulis fere inaequalibus.

Hab. in foliis *Sapindi oblongifolii*, Durban, 11.7.11, leg. Doidge [1572].

Meliola Indigoferae Syd. nov. spec.

Plagulae plerumque hypophyllae orbiculares v. irregulares, 1–4 mm. diam. saepe confluentes et tunc totam fere paginam folii occupantes. Mycelium ex hyphis undulatis, brunneis, opposite ramosis, septatis (articulis 25–30 μ longis) 5–7 μ crassis compositum. Hyphopodia capitata opposita, alternantia v. unilateralia, 14–16 μ longa et 7–10 μ lata ; cellula basali breviter cylindracea ; apicali ovoidea v. globulosa. Hyphopodia mucronata inter hyphopodia capitata interspersa, opposita, tenue ampullacea, 12–15 μ longa. Setae myceliales sat numerosae, curvato-acclivae v. geniculatae, pellucide brunneae 150–300 μ longae, basi 6–10 μ crassae, sursum pallidiores et sensim attenuatae, apice acutae. Perithecia in centro plagularum laxe gregaria, atra, globosa ad verticem applanata, 150–220 μ diam. ; cellulis parietis leniter convexis. Asci bispori. Sporae 4-septatae, cylindraceae, rectae v. leniter curvatae, vix constrictae, utrinque rotundatae et attenuatae, 30–38 $\times$ 12–15 μ, non-nullae usque 42 μ longae.

Hab. in foliis *Indigoferae natalensis*, Buccleuch, Natal, 17.7.18, leg. Doidge [11550].

Meliola littoralis Syd. nov. spec.

Plagulae amphigenae, plerumque epiphyllae, atrae, tenues, sub-orbiculares 2–5 mm. diam. vel confluendo majores et irregulares. Mycelium aracnoideum ex hyphis brunneis rectiusculis v. plus minus undulatis, septatis (articulis 20–40 μ longis) opposite ramosis, 7–8 μ crassis compositum. Hyphopodia capitata alternantia v. unilateralia, 23–30 μ longae, cellula basali breviter cylindracea v. cylindraceo-conoidea, 7–10 μ longa, apicali ovoidea v. sub-cylindracea 10–12 μ lata. Hyphopodia mucronata numerosa, conspicua, opposita alternantia v. unilateralia, ampullacea collo brevi, 13–16 μ longa. Setae myceliales sat numerosae sparsae, 300–640 μ longae, basi atrae opacae et 8–10 μ crassae, sursum ad apicem pellucidum obtusum sensim attenuatae. Perithecia sparsa sat numerosa, atra globosa, 190–240 μ diam. cellulis parietis convexis. Asci ellipsoidei, 2–4-spori. Sporae brunneae, 4-septatae, cylindraceae, leniter constrictae, utrinque late rotundatae 40–45 $\times$ 17–20 μ.

Hab. in follis *Plectroniae* sp. Knysna, 13.5.23, leg. Doidge [17196].

Meliola Osyridis Doidge nov. spec.

Plagulae amphigenae sed plerumque hypophyllae, atrae, orbiculares usque 3 mm. diam. saepe confluendo majores, irregulares. Mycelium ex hyphis brunneis, rectiusculis v. leniter undulatis, septatis (articulis 10–20 μ longis) opposite ramosis, 6–8 μ crassis compositum. Hyphopodia capitata alternantia v. unilateralia, 20–30 μ longa, cellula basali breviter cylindraceo-conoidea, apicali ovata v. cylindracea, 7–10 μ lata. Hyphopodia mucronata sat numerosa, opposita, ampullacea 15–17 μ longa et basi 6–10 μ lata, collo brevi crassiusculo curvato. Setae myceliales sat numerosae, simplices, rectae v. leniter flexuosae, 240–340 μ longae, basi opacae et 7–8 μ crassae, sursum ad apicem obtusum sub-pellucidum sensim attenuatae. Perithecia in centro plagularum gregaria atra globosa minute verrucosa 200–250 μ diam. cellulis parieties convexis v. conoideis. Asci bispori fugaces. Sporae cylindraceae brunneae 4-septatae vix constrictae utrinque rotundatae 43–47 $\times$ 17–20 μ.

Hab. in foliis *Osyridis compressae*, Grahamstown, 15.11.17, leg. Doidge [10954].

Meliola rhoina Doidge nov. spec.

Plagulae amphigenae, atrae, velutinae 1–3 mm. diam. haud raro confluentes tunc partem plus minus magnam folii occupantes. Mycelium ex hyphis reticulatis brunneis,

plus minus undulatis, rarius subtoruloisis, septatis (articulis 17–30 μ longis) alterne v. irregulariter ramosis, 7–10 μ crassis compositum. Hyphopodia capitata alternantia, recta v. curvata, 18–33 μ longa, cellula basali breviter cylindracea vel cylindraceo-conoidea, 6–10 μ longa ; apicali plus minus ovata fere semper plus minus irregulari saepe sub-lobata 10–15 μ lata, apice rotundata v. truncata. Hyphopodia mucronata haud numerosa, praecipue in centro plagularum evoluta, opposita, pallidiora, ampullacea collo tenui 18–22 × 8–10 μ. Setae myceliales sat numerosae sparsae, erectae, 280–400 μ longae, basi opacae, 7–9 μ crassae, sursum haud vel vix attenuatae apice sub-pellucidae acutae (apice rarissime bifurcatae). Perithecia sparsa v. subgregaria, atra, globosa, 180–240 μ diam., cellulis parietis leniter convexis. Asci ellipsoidei v. ovati, breviter pedicellati, 2-4-spori. Sporae 4-septatae, cylindraceae utrinque late rotundatae, leniter constrictae 43–50 × 16–18 μ.

Hab. in foliis *Rhois longispinae*, Despatch prope Uitenhage, Cape Province, 24.3.11, leg. Doidge [1239].

Meliola Scolopiae Doidge nov. spec.

Plagulae amphigenae, aterrimae, velutinae irregulariter sparsae, plus minus orbiculares, usque 5 mm. diam., saepe confluentes. Mycelium ex hyphis dense et irregulariter reticulato, ramosis, rectis vel undulatis, 6–7 μ crassis compositum. Hyphopodia capitata numerosa, alternantia vel unilateralia, recta vel curvata, 23–27 μ longa, cellula basali 6–13 μ longa, et 6–7 μ lata, cylindraceo-conoidea vel gibbosa ; cellula apicali plus minus clavata, ambitu irregulariter 2–5 angulata, 10–18 μ lata, lobulis 2–5 humilibus late rotundatis vel truncatis praedita. Hyphopodia mucronata haud numerosa, inter hyphopodia capitata interspersa, praecipue in centro plagularum evoluta, opposita v. unilateralia plus minus lageniformia, continua, 20–24 μ longa, e basi ventricoso-dilatata 6–6·5 μ lata subito in collum rectum vel curvatum 3 μ crassum attenuata. Setae myceliales copiosae, erectae rectae vel leniter curvatae simplices, opace atro-brunneae, 300–400 μ longae, ad basim 7–10 μ crassae, apicem versus leniter attenuatae, ad apicem acutae. Perithecia laxe gregaria, atra, globosa, 200–300 μ diam., in sicco collapsa, cellulis parietis protruberantibus convexis, 12–16 μ diam. Asci 2–3-spori, fugaces. Sporae atro-brunneae, 3-septatae, ellipsoideae, utrinque rotundatae, plus minusve constrictae, 53–57 × 16·5–20 μ.

Hab. in foliis *Scolopiae Zeyheri* Pirie, prope Kingwilliamstown, 18.7.27, leg. Doidge [22421].

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